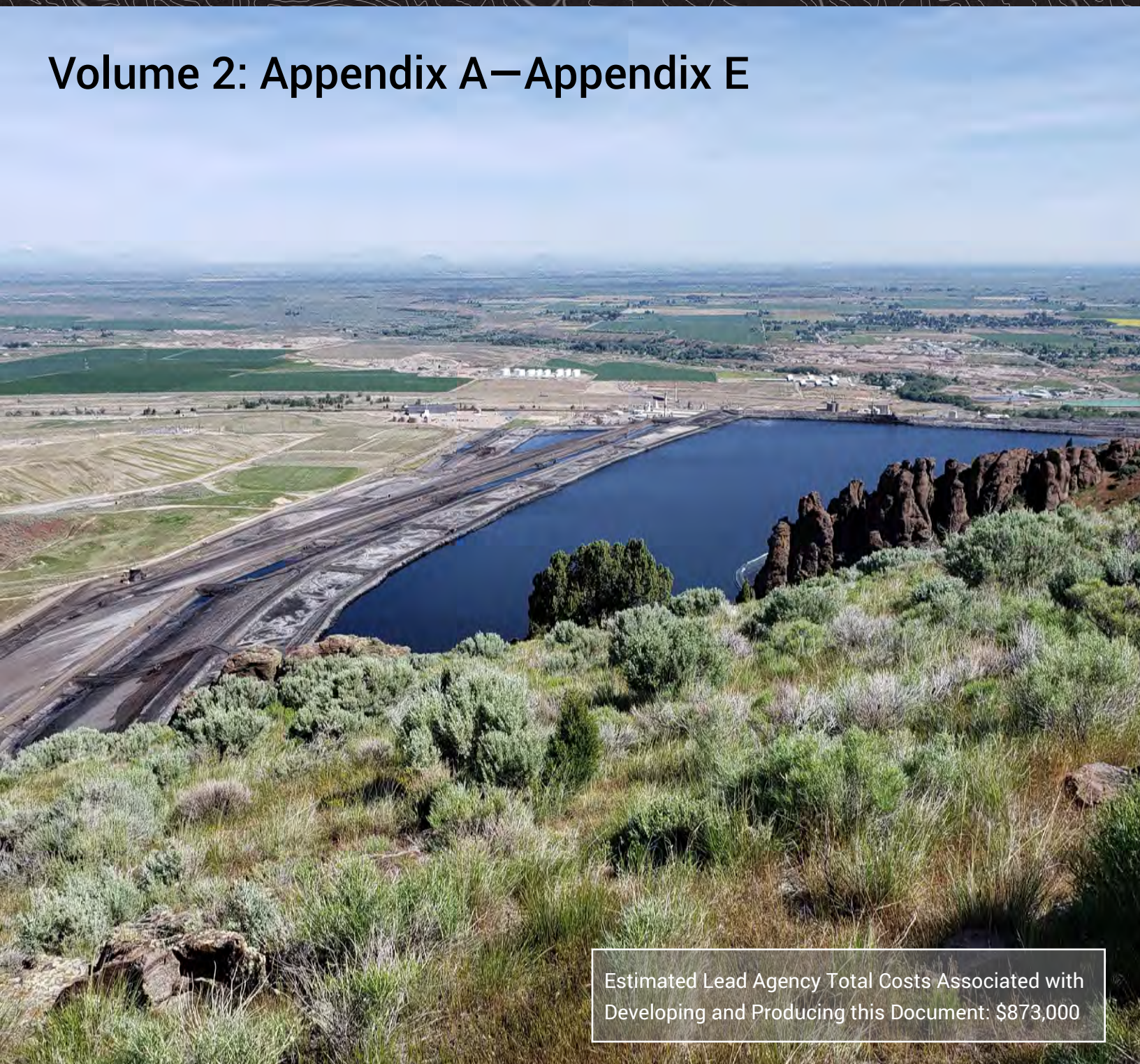
U.S. Department of the Interior
Bureau of Land Management

Blackrock Land Exchange Draft Environmental Impact Statement

Pocatello Field Office

Volume 2: Appendix A—Appendix E



Estimated Lead Agency Total Costs Associated with Developing and Producing this Document: $873,000

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DOI-BLM-ID-I020-2019-0008-EIS

Volume 2: Appendix A–Appendix E

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December 2019

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BLM MISSION

It is the mission of the Bureau of Land Management to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.

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Blackrock Land Exchange

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Appendix A

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Blackrock Land Exchange

Draft Environmental Impact Statement

Appendix B

Glossary

Acre-foot: A unit of volume equal to the volume of 1 acre of surface area at a depth of 1 foot.

Animal Unit Month (AUM): The amount of forage needed to sustain one cow or its equivalent for 1 month.

Allotment: A land area where one or more operators graze their livestock. The allotment generally consists of public land but may include parcels of private and State-owned lands. The number of livestock and season of use are stipulated for each allotment by the landowner.

Average Annual Daily Vehicle Trips: Estimates the mean traffic volume across all days for a year for a given location along a roadway.

Best Management Practices (BMPs): Methods that have been determined to be the most effective and practical means of preventing or reducing impacts on a resource.

Cooling Pond: Cooling ponds are used for heat transfer of the cooling circuit water rather than cooling towers. The hot water would be pumped to the ponds, allowed to cool, and then returned to the cooling water circuit to be used again in a closed loop system. Cooling ponds are the most appropriate method for reducing fluoride emissions, while also continuing to meet operational requirements at the Don Plant facility.

Cooling Tower: The cooling towers at the Don Plant cascade contact cooling water over packing to increase air contact and transfer heat load to the surrounding air through sensible heat transfer or evaporation. The cooling towers are considered a source of fluoride emissions.

Cultural Resources: Those fragile and nonrenewable remains of human activity, occupation, or endeavor reflected in district, sites, structures, building, objects, artifacts, ruins, works of art, architecture, and natural features that were of importance in past human events. These resources consist of (1) physical remains, (2) areas where significant human events occurred, even though evidence of the event no longer remains, and (3) the environment immediately surrounding the actual resource.

Cumulative Effects/Impacts: The effect or impact on the resource that results from incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

Direct Effect: Direct effects "are caused by the action and occur at the same time and place" (40 Code of Federal Regulations [CFR] 1508.8(a)). For purposes of this Environmental Impact Statement (EIS), direct effects are the changes in land ownership, regulatory requirements, and management that would occur as a result of the proposed land exchange. This includes management of the acquired non-Federal lands in a manner consistent with adjacent or nearby public lands as specified in the *Record of Decision and Pocatello Field Office Approved Resource Management Plan* (BLM 2012).

Disposal: Transferring of land out of Federal ownership by various methods such as exchange, sale, Recreation and Public Purposes Act, and/or State indemnity selection.

Encumbrances: Encumbrances include liens, deed restrictions, easements, encroachments, and licenses.

Environmental Impact Statement (EIS): A detailed statement required by the National Environmental Policy Act (NEPA) when an agency proposes a major Federal action significantly affecting the quality of the human environment. There is usually a Draft EIS followed by a Final EIS.

Eastern Michaud Flats (EMF) Superfund Site: The 2,530-acre EMF Superfund site is approximately 2.5 miles northwest of the city of Pocatello in Power and Bannock Counties in southeastern Idaho. Portions of the site are within the boundaries of the Fort Hall Indian Reservation. The site is divided into three

operable units (OUs): OU1 (FMC OU), OU2 (Simplot OU), and OU3 (Off-Plant OU). The FMC and J.R. Simplot Company (Simplot) OUs include two adjacent phosphate-ore processing facilities: the former FMC Elemental Phosphorous Plant and the active Simplot Don Plant. The site encompasses the areal extent of contamination at and from both plants, including the Off-Plant OU for portions beyond the FMC and Simplot plant boundaries.

Eastern Michaud Flats Off-Plant Operable Unit (OU): The Off-Plant OU of the EMF site is not specifically mapped. In general, the Off-Plant OU is defined as the areal extent of all land, including federal, private, and tribal land, surrounding the FMC and Simplot plants with contamination originating from the plants.

Federal Lands: The publicly owned lands that have been selected by the project proponent for acquisition in a land exchange.

Finding of No Significant Impact (FONSI): A FONSI is issued when environmental analysis and interagency review during the Environmental Assessment process find a project to have no significant impacts on the quality of the environment.

Forage: Vegetation used for food by wildlife, particularly big game wildlife and domestic livestock.

Geographic Information Systems (GIS): A system that presents spatial geographic data.

Greenhouse Gas (GHG): An atmospheric gas such as water vapor, carbon dioxide, methane, and ozone that absorbs and emits radiation.

Gypsum Stack: A disposal area for gypsum and process water, once the gypsum has been separated from the phosphoric acid.

Indirect Effect: Indirect effects "*are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the patterns of land use, populations density, or growth rate, and related effects on water and air and other natural systems, including ecosystems*" (40 CFR 1508.8(b)). For purposes of this EIS, making the Federal and non-Federal lands available for reasonably foreseeable actions that would otherwise not occur is considered an indirect effect of the proposed land exchange.

Leachate: A contaminated liquid created from water percolating through a waste disposal site, accumulating contaminants, and moving into subsurface areas (such as the movement of water through the gypsum stack liner).

Memorandum of Agreement (MOA): A written document describing a cooperative relationship between two parties wishing to work together on a project or to meet an agreed-upon objective. An MOA serves as a legal document and describes the terms and details of the partnership agreement.

Mitigate, Mitigation: Mitigation includes (a) avoiding the impact altogether by not taking a certain action or parts of an action, (b) minimizing impacts by limiting the degree or magnitude of the action and its implementation, (c) rectifying the impact by repairing, rehabilitating, or restoring the affected environment, (d) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action, and (e) compensating for the impact by replacing or providing substitute resources or environments.

National Ambient Air Quality Standards (NAAQS): The Clean Air Act requires the U.S. Environmental Protection Agency (EPA) to set NAAQS for pollutants that are considered harmful to the public and environment. These pollutants come from numerous and diverse sources. The EPA has set NAAQS for six principal pollutants, which are called "criteria" pollutants:

- Carbon monoxide
- Lead
- Nitrogen oxides
- Particulate matter
  - PM_{10} (any particulate matter with a diameter less than or equal to 10 microns)
  - $PM_{2.5}$ (any particulate matter with a diameter less than or equal to 2.5 microns. Also called "fine particulate matter")
- Ozone
- Sulfur dioxide

The Clean Air Act established two types of NAAQS.

1. **Primary standards:** set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly.
2. **Secondary standards:** set limits to protect public welfare, including protection against visibility impairment, damage to animals, crops, vegetation, and buildings.

National Environmental Policy Act (NEPA): Legislative act passed in 1969 as the national charter for analysis of impacts of Federal actions upon the quality of the human environment. NEPA establishes policy, sets goals, and provides means for carrying out the policy. Regulations from 40 CFR 1500–1508 implement the act.

National Register of Historic Places (NRHP): A list, kept by the Secretary of the Interior, of districts, sites, buildings, structures, and objects significant in American history, architecture, archaeology, and culture.

Non-Federal Lands: The privately owned lands that are being offered in exchange for public lands in a land exchange.

Noxious Weeds: A weed that is considered to be harmful to the environment or animals, especially one that may be the subject of regulations governing attempts to control it.

Off-reservation Tribal Treaty Rights: Off-reservation treaty rights that may be reserved on present-day national forests and Bureau of Land Management (BLM) land include grazing rights, hunting and fishing rights, gathering rights and interests, water rights, and subsistence rights.

Parcel: A defined piece of land or real estate, usually resulting from the division of a larger area of land.

Patent: A document conveying title to land from the U.S. government to private ownership.

Phosphogypsum: A byproduct of the chemical reaction that produces phosphoric acid. Phosphogypsum is mechanically separated from the phosphoric acid at the Don Plant and then mixed with process water for transport to a storage area located south and southeast of the Don Plant site known as the gypsum stack (or phosphogypsum stack).

Record of Decision: A public document that reflects a Federal agency's final decision on a proposed project, rationale behind that decision, and commitments to monitoring and mitigation.

Resource Management Plan (RMP): A planning document developed by the BLM that provides guidelines and direction for making land tenure decisions for short-term and long-term management of public lands and resources within a district.

Right-of-way (ROW): A legal right to use, occupy, or access land or water areas for specified purposes.

Riparian: Plant communities occurring in association with any spring, lake, river, stream, creek, wash, arroyo, or other body of water or channel having banks and bed through which waters flow at least periodically. These habitats are generally characterized or distinguished by a difference in plant species composition or an increase in the size and/or density of vegetation as compared to upland areas.

Scope: Scope consists of the range of actions, alternatives, and impacts to be considered in the EIS.

Scoping: Procedures by which agencies solicit input from the public, other agencies, and Indian tribes to determine the extent of analysis necessary for a proposed action (i.e., the range of actions, alternatives, and impacts to be addressed; identification of significant issues related to a proposed action; and the depth of environmental analysis, data, and task assignments needed).

Sensitive Species: Those species designated by a BLM State Director, in cooperation with a State agency responsible for managing the species, as sensitive. Sensitive species are those species (1) under status review by the U.S. Fish and Wildlife Service/National Marine Fisheries Service; (2) whose numbers are declining so rapidly that Federal listing may become necessary; (3) with typically small and widely dispersed populations; or (4) inhabiting ecological refugia or other specialized or unique habitats.

Slurry: A mixture of phosphate ore concentrate and water.

Special Status Species: A grouping of wildlife species that includes proposed species, threatened and endangered species, candidate species, State-listed species, and sensitive species.

Stormwater Pollution Prevention Plan (SWPPP): A plan that is used to reduce pollutants entering waterbodies during storm (i.e., rain) events. Includes sources of pollution and control measures.

Superfund Site: A Superfund site is any land in the United States that has been contaminated by hazardous waste and identified by the EPA as a candidate for cleanup because it poses a risk to human health and/or the environment.

Tailings: The remains of milled ore that are regarded as too poor to be treated further.

Visual Resource Management (VRM) Classes: Classification containing specific objectives for maintaining or enhancing visual resources, including the kinds of structures and modifications acceptable to meet established visual goals.

Voluntary Mitigation Parcel A: 159 acres of Simplot-owned land in the Blackrock Canyon area that would be acquired by the BLM under Alternatives A and B.

Voluntary Donation Parcel B: 950 acres of Simplot-owned land that, under Alternatives A and B, would be transferred to the Bureau of Indian Affairs or the Shoshone-Bannock Tribes, which would consolidate land ownership on the Fort Hall Reservation and make additional lands available to tribal uses. The 950 acres of land that would be offered for donation include:

- Approximately 200 acres of irrigated agricultural lands that could be incorporated into the tribal Agricultural Resource Management program.
- Approximately 750 acres of improved rangeland within the Fort Hall Reservation, which may provide areas for livestock grazing, access to riparian areas along certain segments of Michaud Creek, and other uses.

Watershed: The geographic region from which water drains into a particular stream, river, or body of water. A watershed includes hills, lowlands, and the body of water into which the land drains. Watershed boundaries are defined by the ridges or divides separating them.

Wetlands: Areas inundated by surface water or groundwater with a frequency sufficient to support vegetation or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction.

Winter Range: Important habitat and forage area for big game, as it provides valuable food and thermal cover that allow ungulate species (specifically mule deer for this analysis) to conserve energy during severe winter weather conditions.

Blackrock Land Exchange

Draft Environmental Impact Statement

Appendix C

Maps

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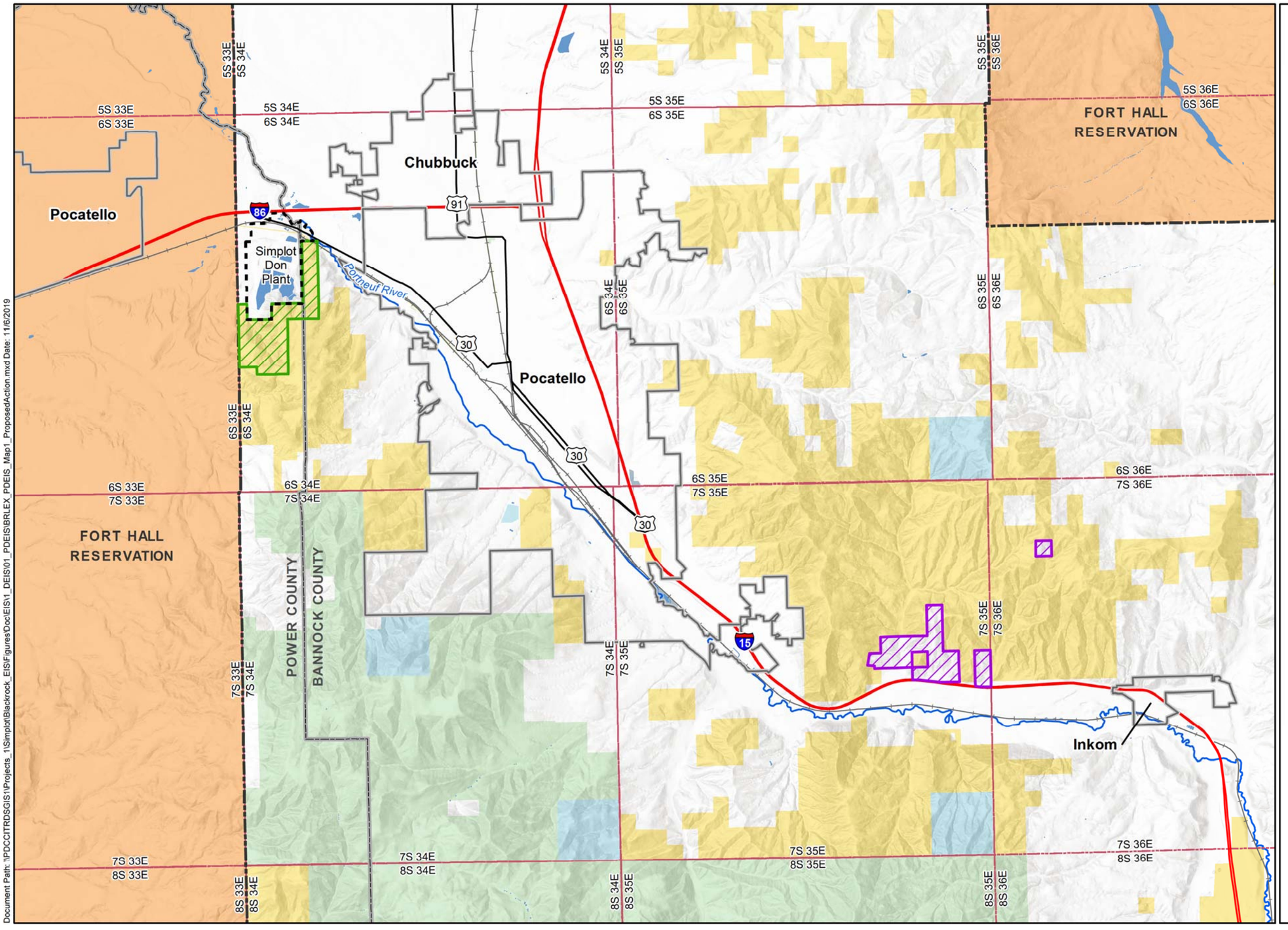
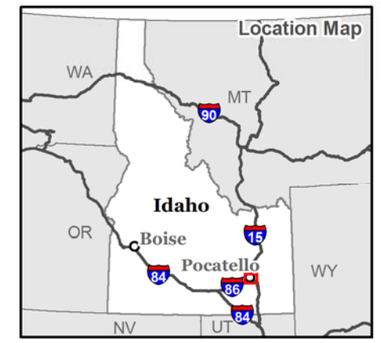
Map 23: Fish and Wildlife – Big Game Areas and Fisheries

Map 24: Socioeconomics and Environmental Justice

Map 25: Water Resources – Watersheds and Surface Water Features





Proposed Action
- Federal Lands
- Non-Federal Lands

Land Ownership
- Bureau of Land Management
- Forest Service
- Private
- State
- State Fish and Game
- Tribal/Bureau of Indian Affairs

N

1:100,000

0 1 2
Kilometers

0 1 2
Miles

Coordinate System: Idaho Transverse Mercator Projection, North American Datum 1983.
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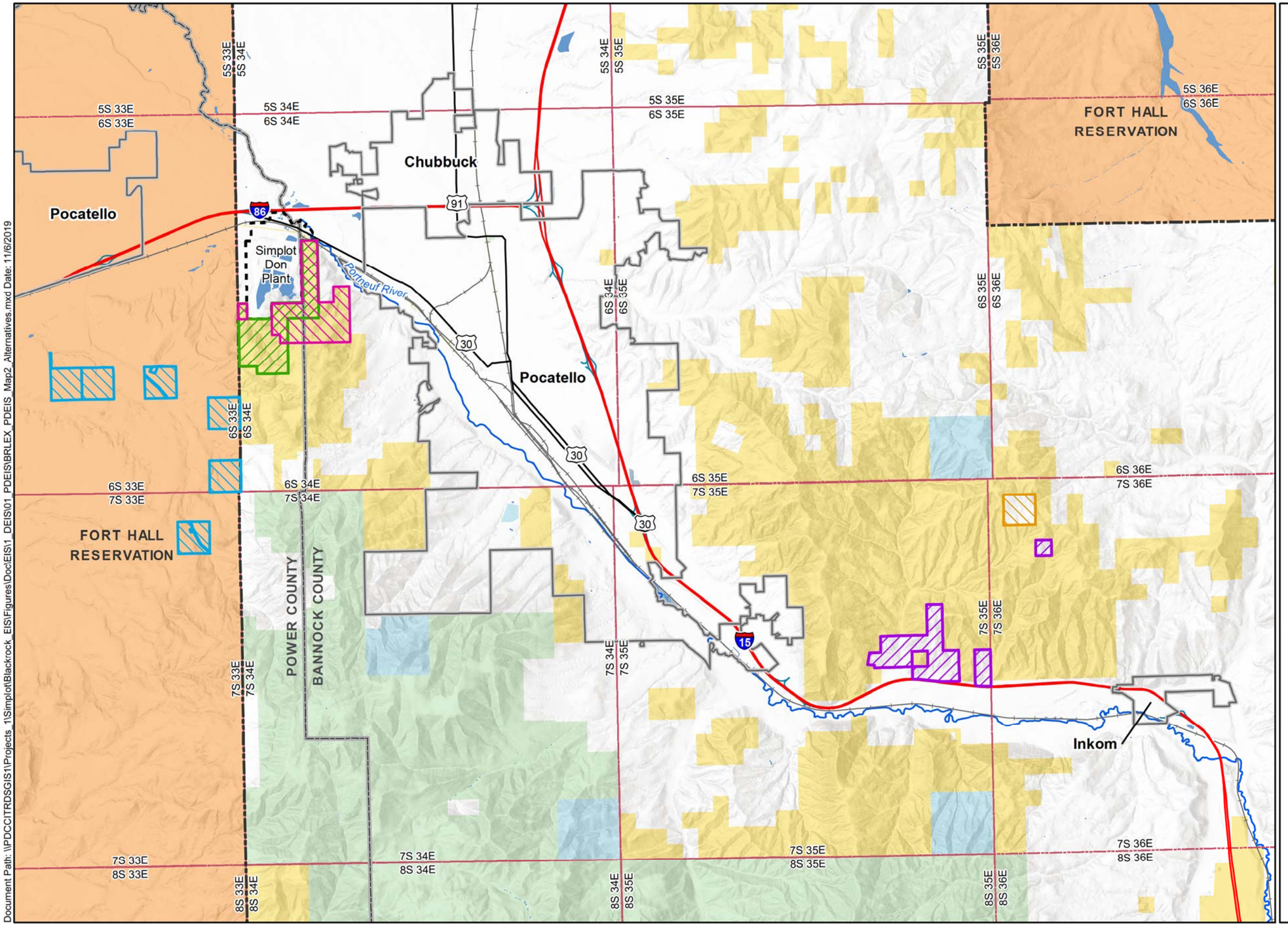
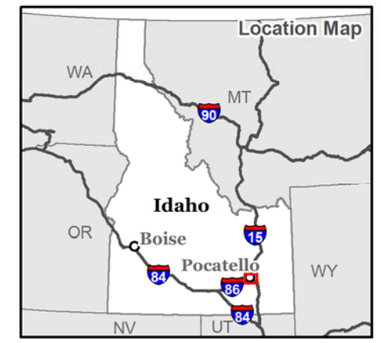
Map 1: Proposed Action





Proposed Action
- Federal Lands
- Non-Federal Lands

Alternative A
- Federal Lands
- Non-Federal Lands
- Parcel A
- Parcel B

Alternative B
- Federal Lands
- Non-Federal Lands
- Parcel A
- Parcel B

Land Ownership
- Bureau of Land Management
- Forest Service
- Private
- State
- State Fish and Game
- Tribal/Bureau of Indian Affairs

N

1:100,000

0 1 2
Kilometers

0 1 2
Miles

Coordinate System: Idaho Transverse Mercator Projection, North American Datum 1983.
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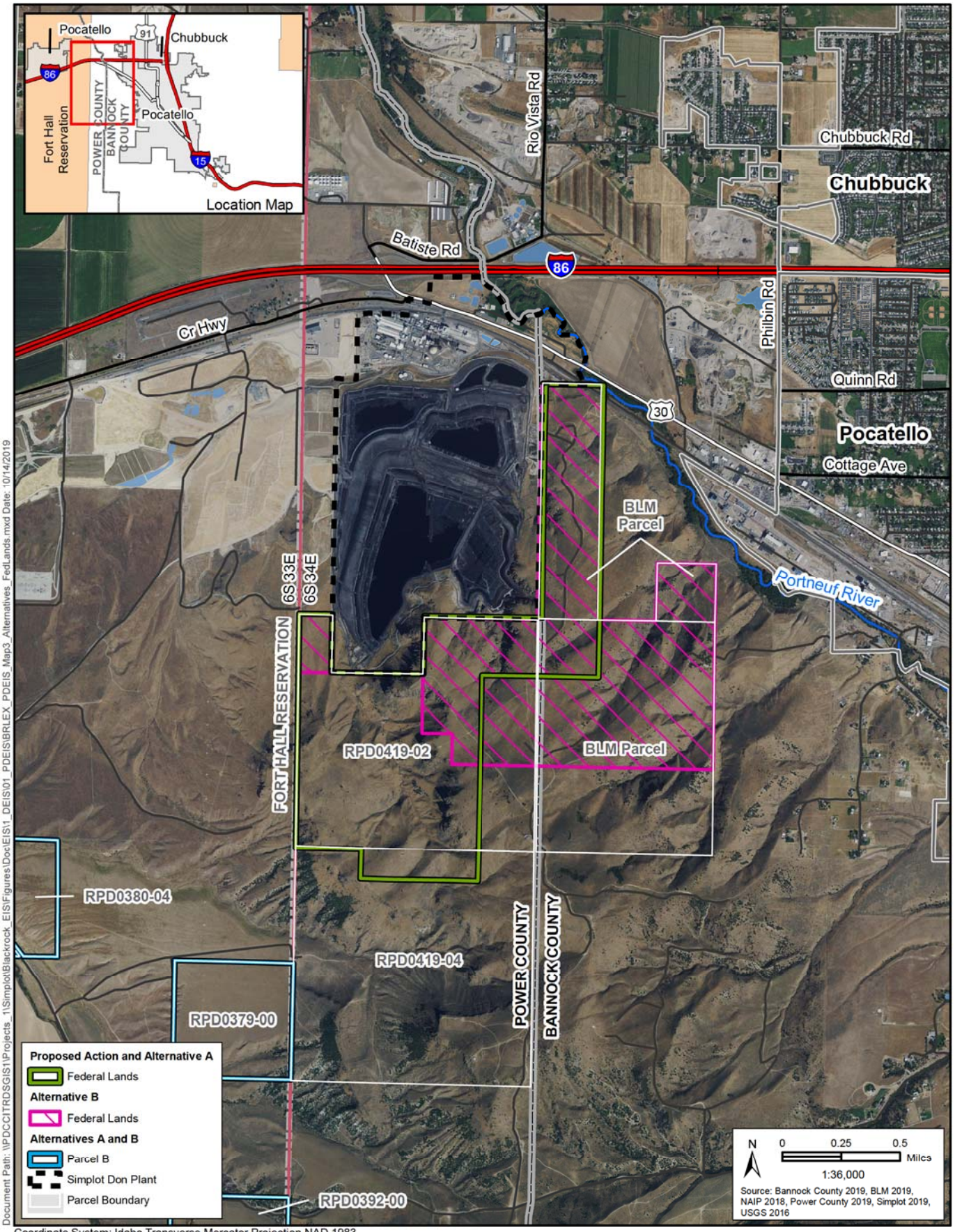
Map 2: Alternatives - Overview



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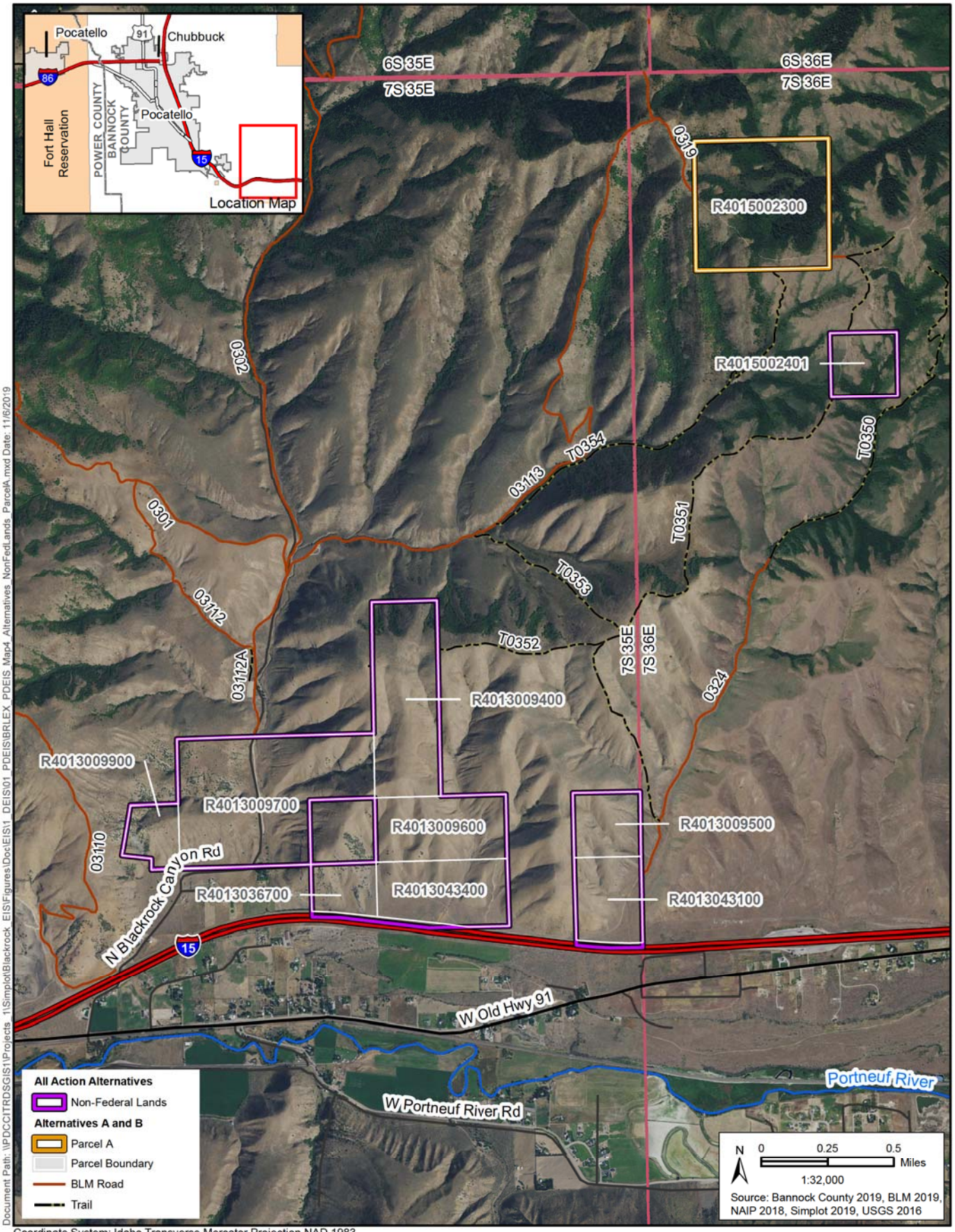
Coordinate System: Idaho Transverse Mercator Projection NAD 1983
No warranty is made by the Bureau of Land Management. The accuracy, reliability, or completeness of these data for individual use or aggregate use with other data is not guaranteed.

Map 3: Alternatives - Federal Lands



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Coordinate System: Idaho Transverse Mercator Projection NAD 1983

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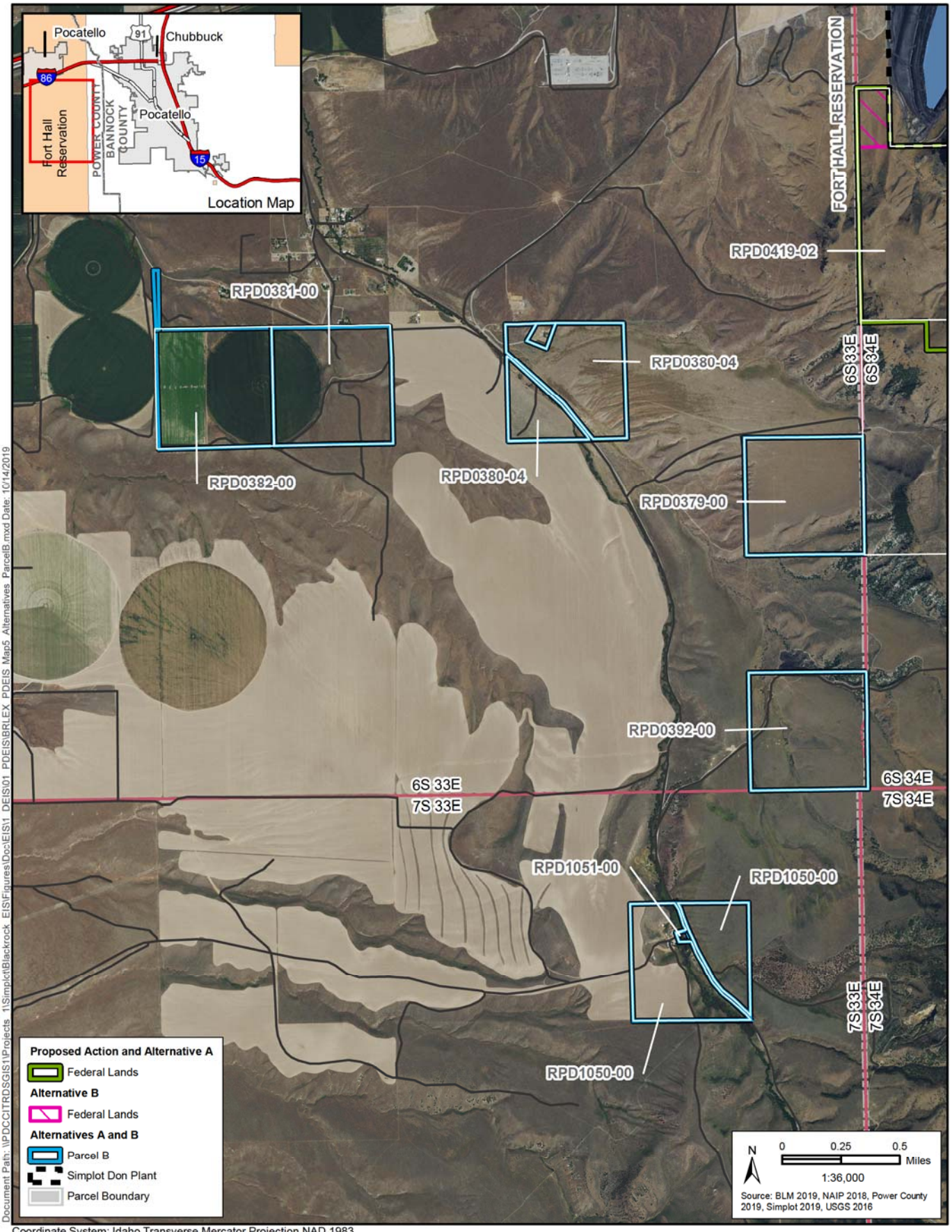
Map 4: Alternatives - Non-Federal Lands and Parcel A



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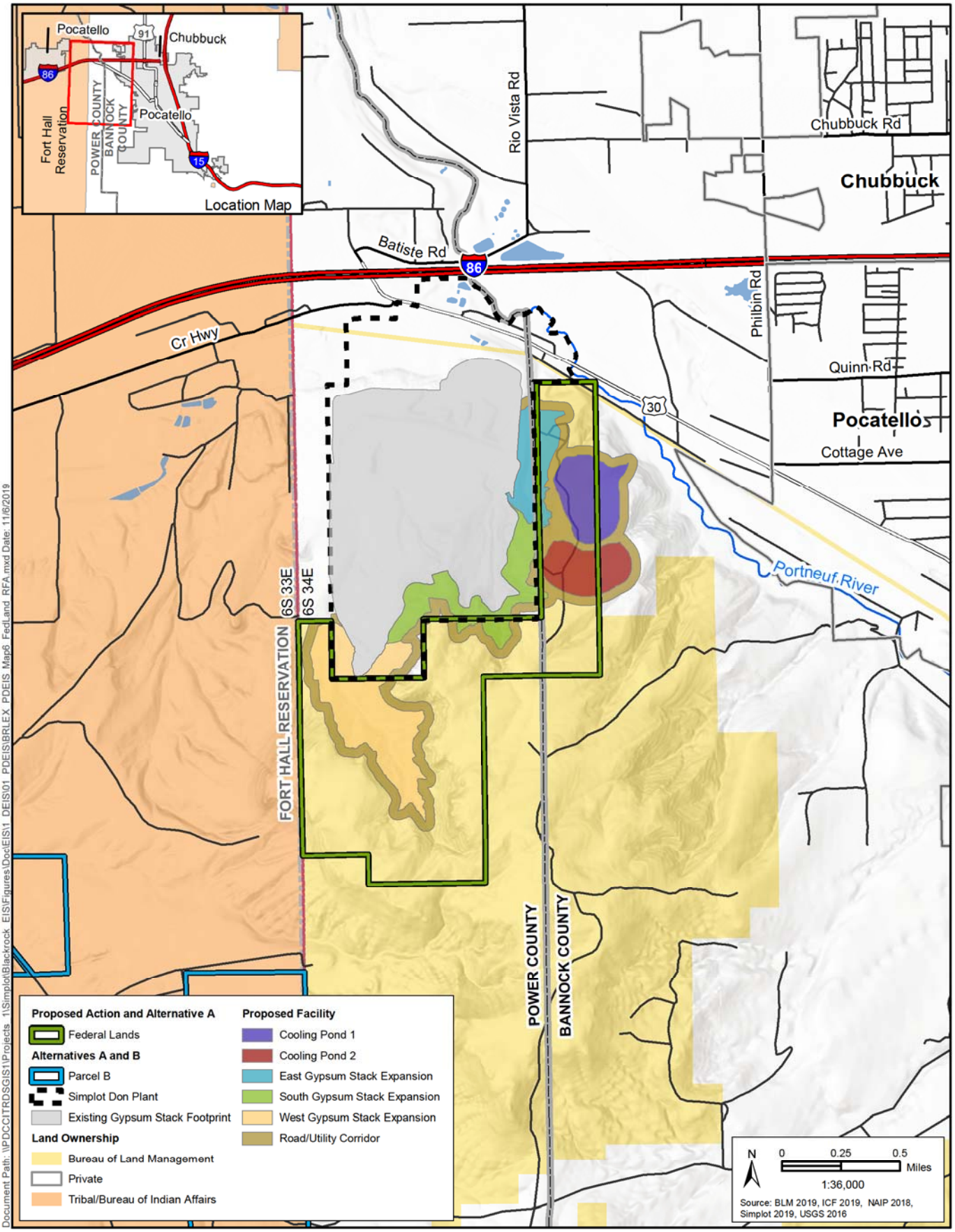
Coordinate System: Idaho Transverse Mercator Projection NAD 1983
No warranty is made by the Bureau of Land Management. The accuracy, reliability, or completeness of these data for individual use or aggregate use with other data is not guaranteed.

Map 5: Alternatives - Parcel B



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Coordinate System: Idaho Transverse Mercator Projection NAD 1983
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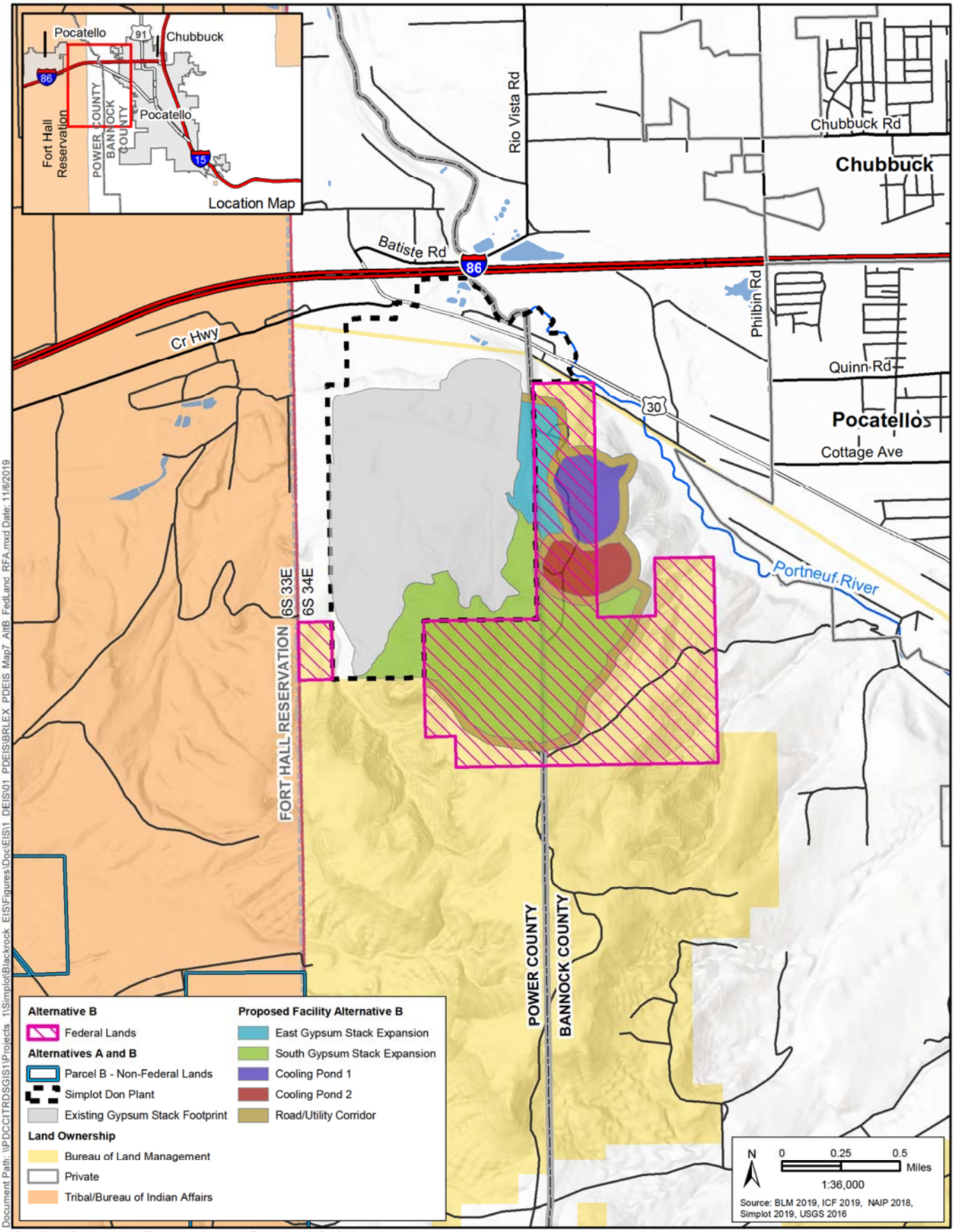
Map 6: Alternatives - Reasonably Foreseeable Actions on Federal Lands (Proposed Action and Alternative A)



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Coordinate System: Idaho Transverse Mercator Projection NAD 1983
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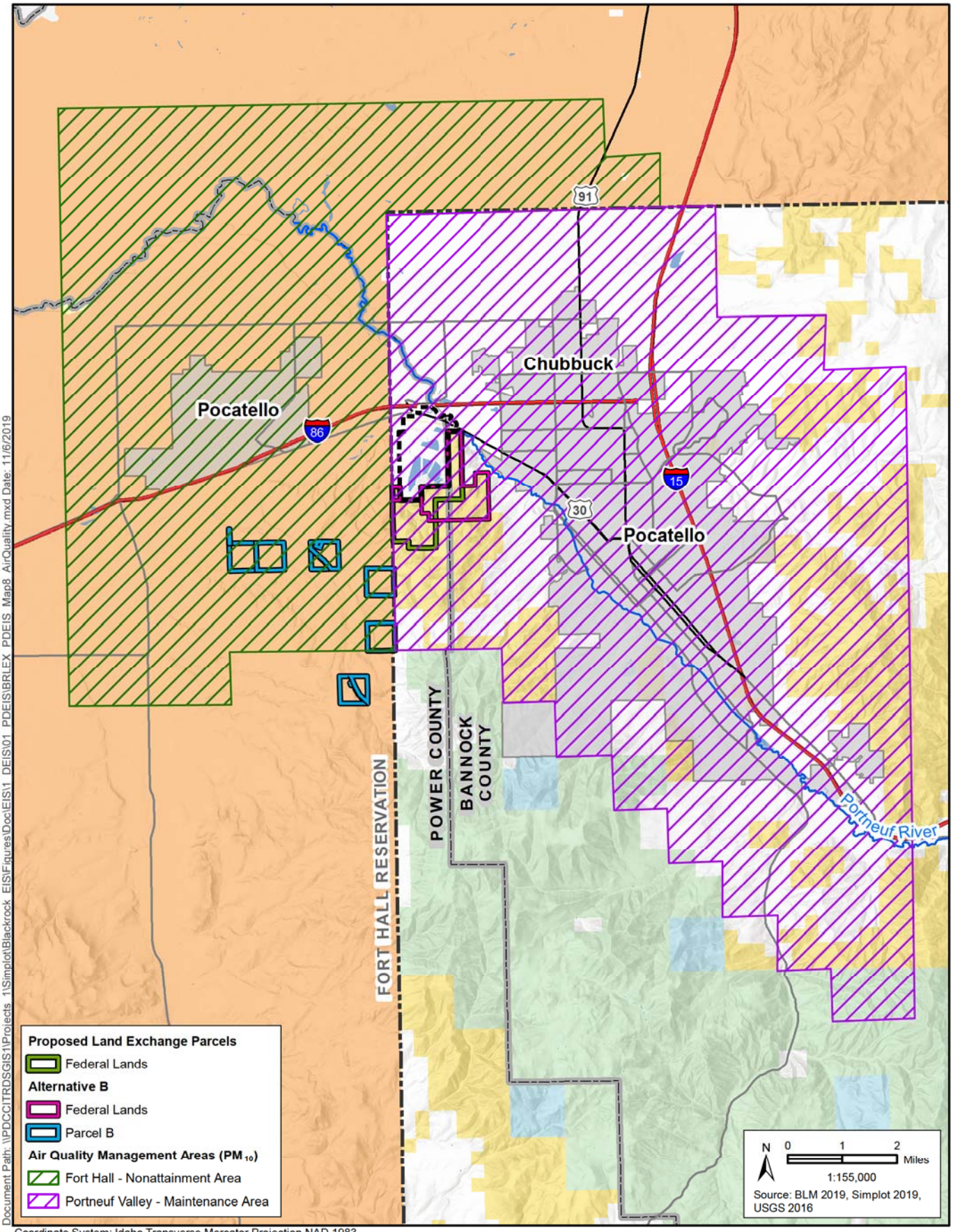
Map 7: Alternatives - Reasonably Foreseeable Actions on Federal Lands (Alternative B)



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Coordinate System: Idaho Transverse Mercator Projection NAD 1983

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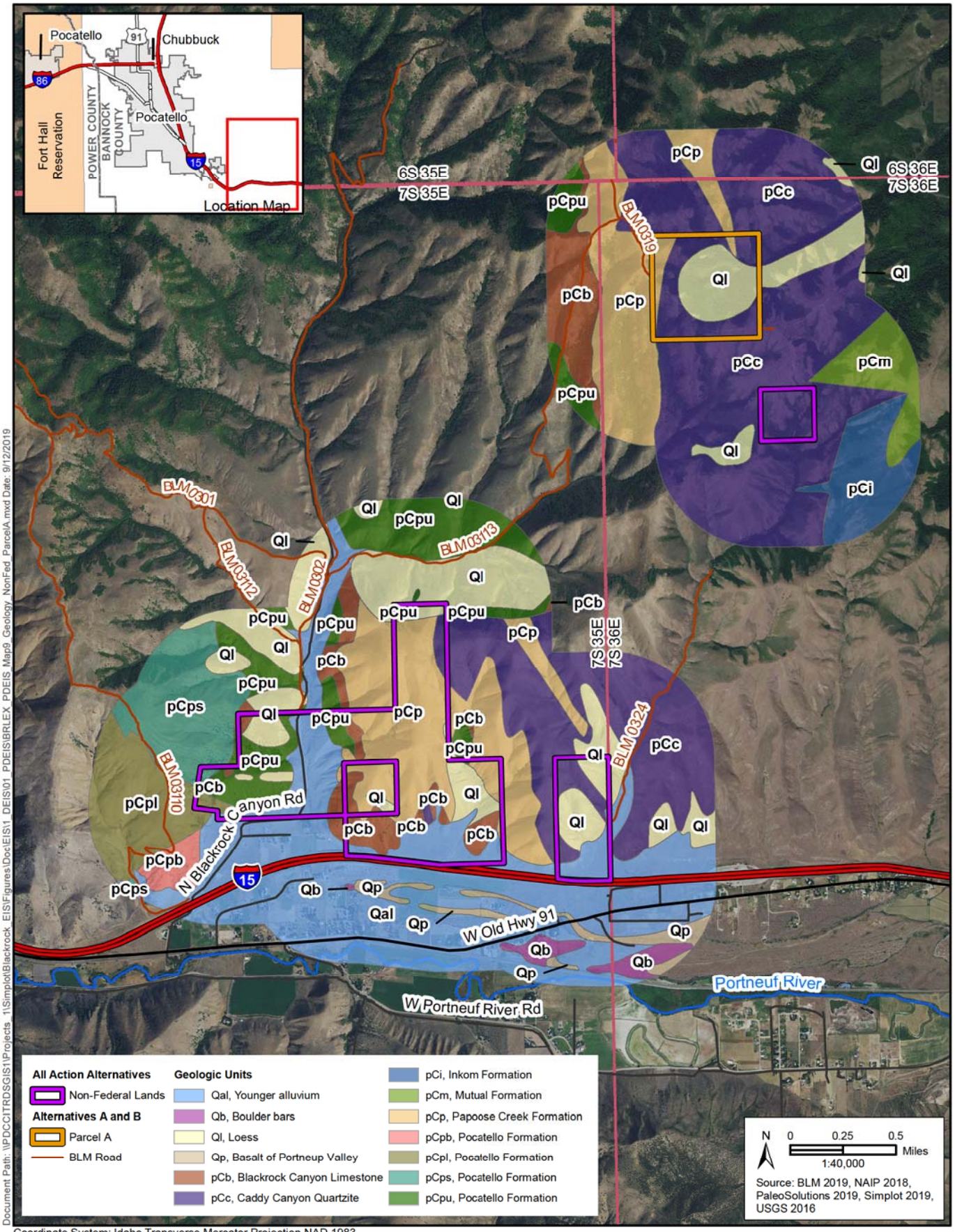
Map 8: Air Quality - Air Quality Management Areas



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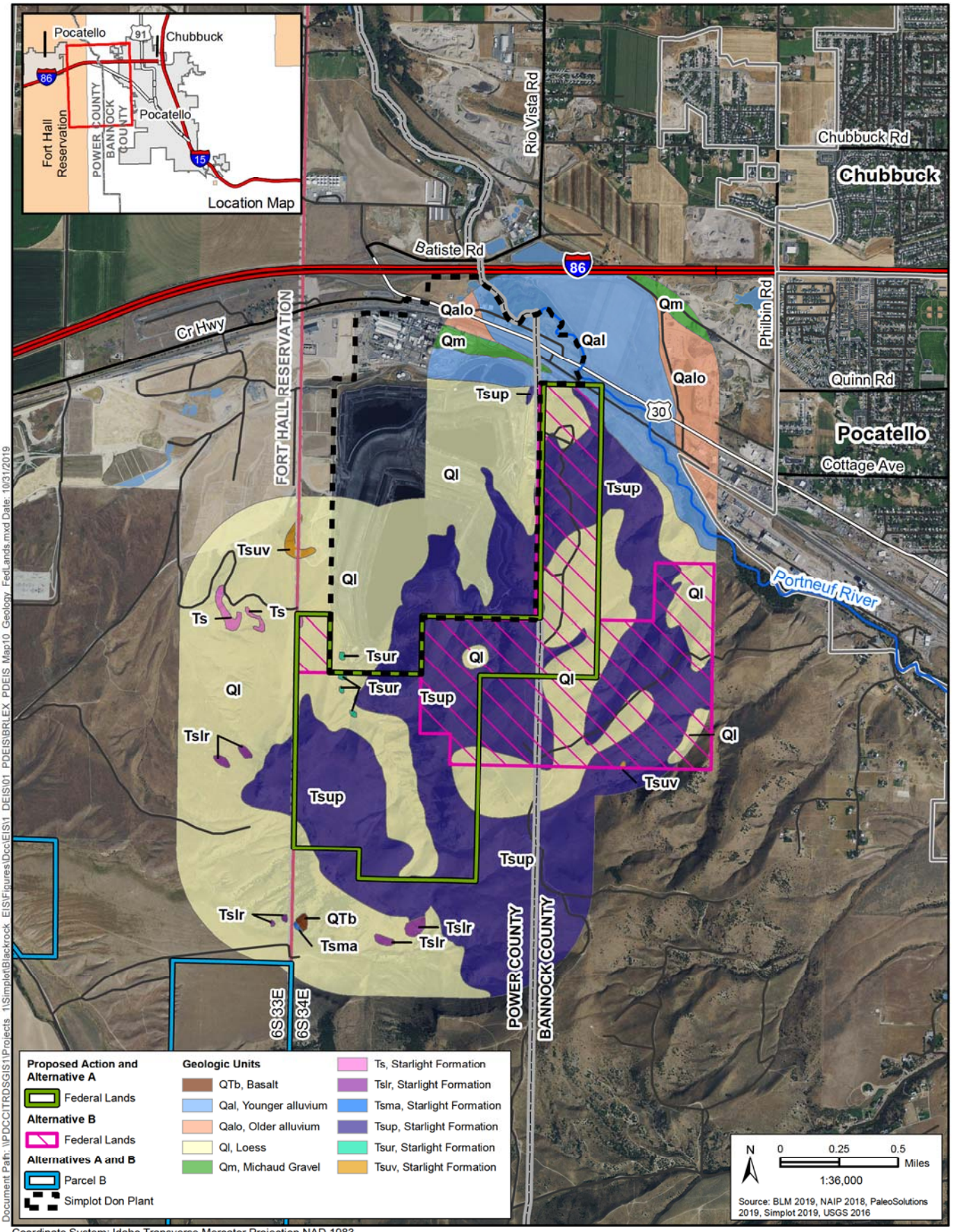
Coordinate System: Idaho Transverse Mercator Projection NAD 1983

No warranty is made by the Bureau of Land Management. The accuracy, reliability, or completeness of these data for individual use or aggregate use with other data is not guaranteed.

Map 9: Geologic Units - Non-Federal Lands and Parcel A



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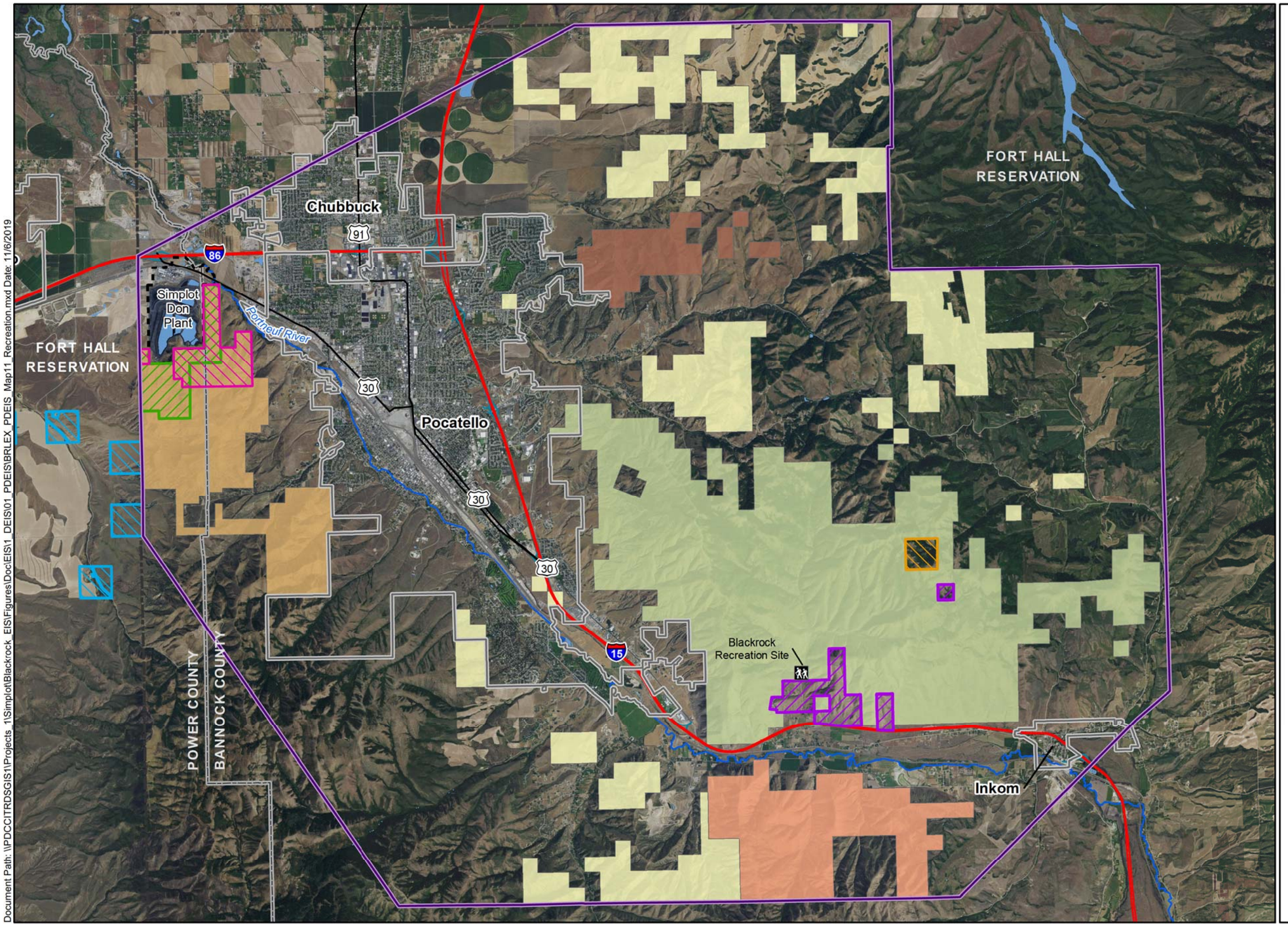
Coordinate System: Idaho Transverse Mercator Projection NAD 1983
No warranty is made by the Bureau of Land Management. The accuracy, reliability, or completeness of these data for individual use or aggregate use with other data is not guaranteed.

Map 10: Geologic Units - Federal Lands



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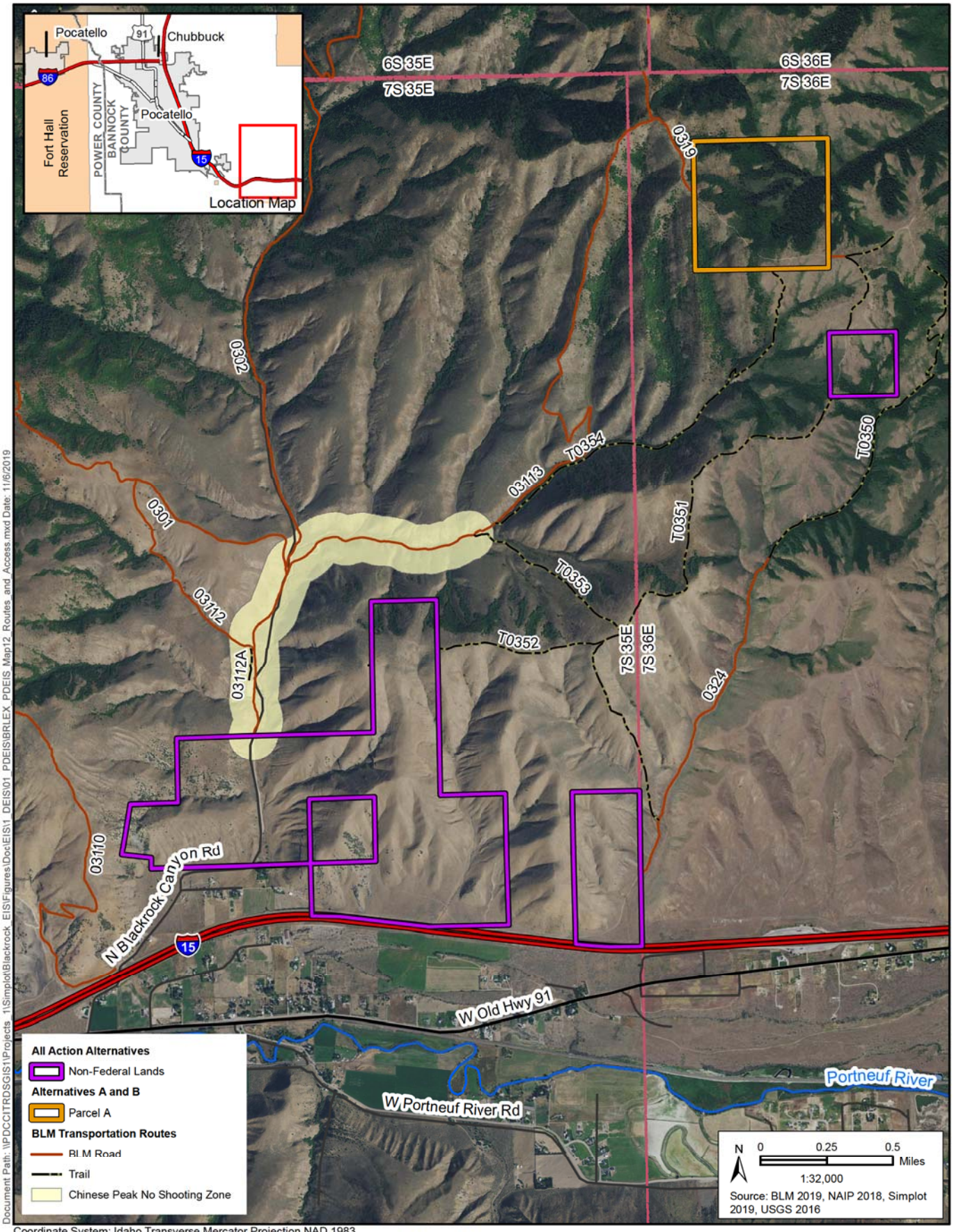
Map 11: Recreation - Recreation Management Areas



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Coordinate System: Idaho Transverse Mercator Projection NAD 1983

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Map 12: Routes and Access – Non-Federal lands and Parcel A

Pocatello
Chubbuck
Simplot Don Plant
Portneuf River
Pocatello
FORT HALL RESERVATION
FORT HALL RESERVATION
POWER COUNTY
BANNOCK COUNTY
Inkom
5S 33E
6S 33E
5S 34E
6S 34E
5S 35E
6S 35E
5S 36E
6S 36E
6S 33E
7S 33E
6S 34E
7S 34E
6S 35E
7S 35E
6S 36E
7S 36E
7S 33E
8S 33E
7S 34E
8S 34E
7S 35E
8S 35E
7S 36E
8S 36E
86
91
30
15

Location Map
WA
MT
OR
Idaho
Boise
Pocatello
WY
NV
UT
90
84
86
15

Visual Resource Management Class
Class II
Class III
Class IV
Proposed Action
Federal Lands
Non-Federal Lands
Alternative A
Federal Lands
Non-Federal Lands
Parcel A
Parcel B
Alternative B
Federal Lands
Non-Federal Lands
Parcel A
Parcel B

N
1:100,000
0 1 2
Kilometers
0 1 2
Miles

Coordinate System: Idaho Transverse Mercator Projection, North American Datum 1983.
No warranty is made by the Bureau of Land Management. The accuracy, reliability, or completeness of these data for individual use or aggregate use with other data is not guaranteed.

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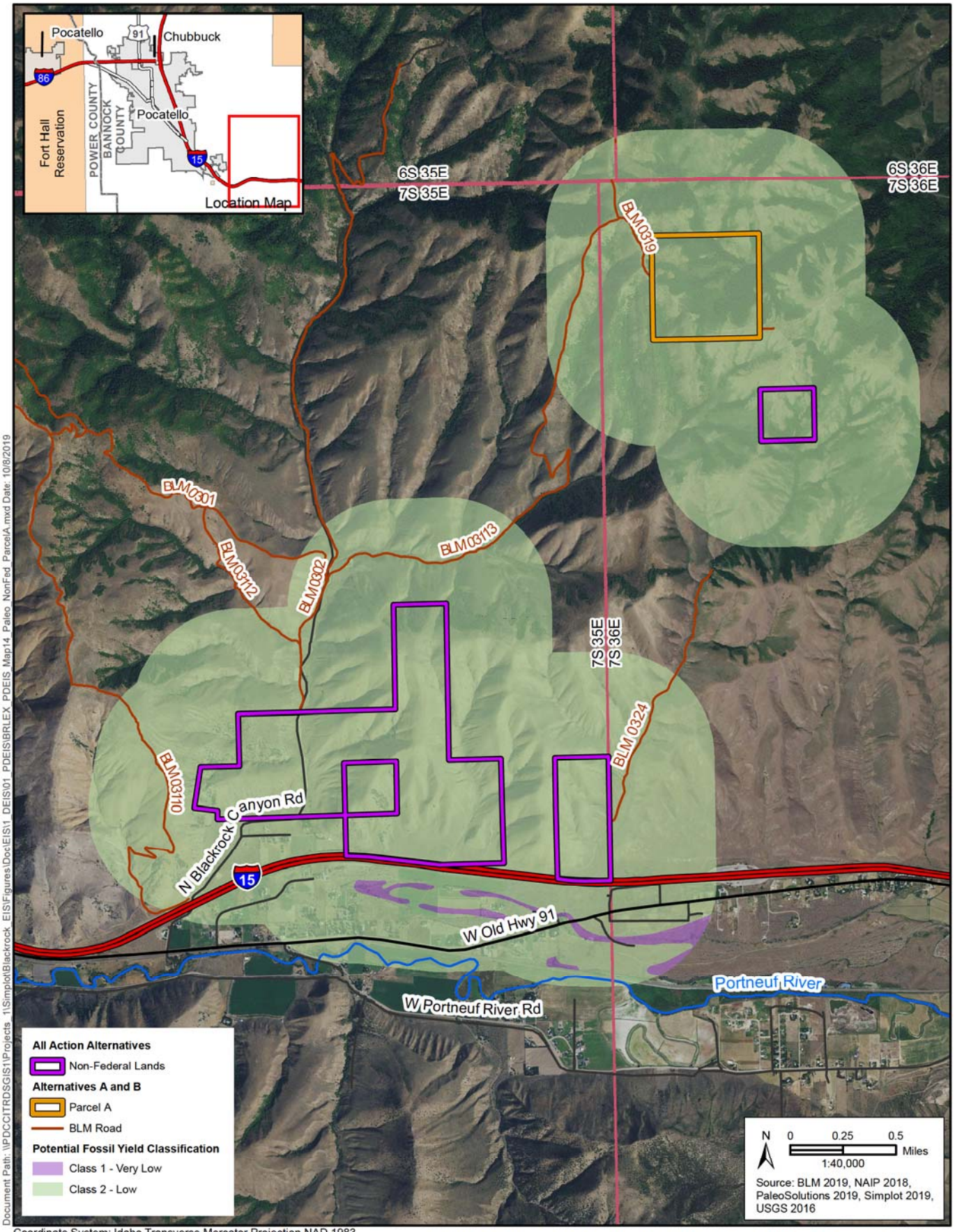
Map 13: Visual Resource - Visual Resource Management Classes



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Coordinate System: Idaho Transverse Mercator Projection NAD 1983

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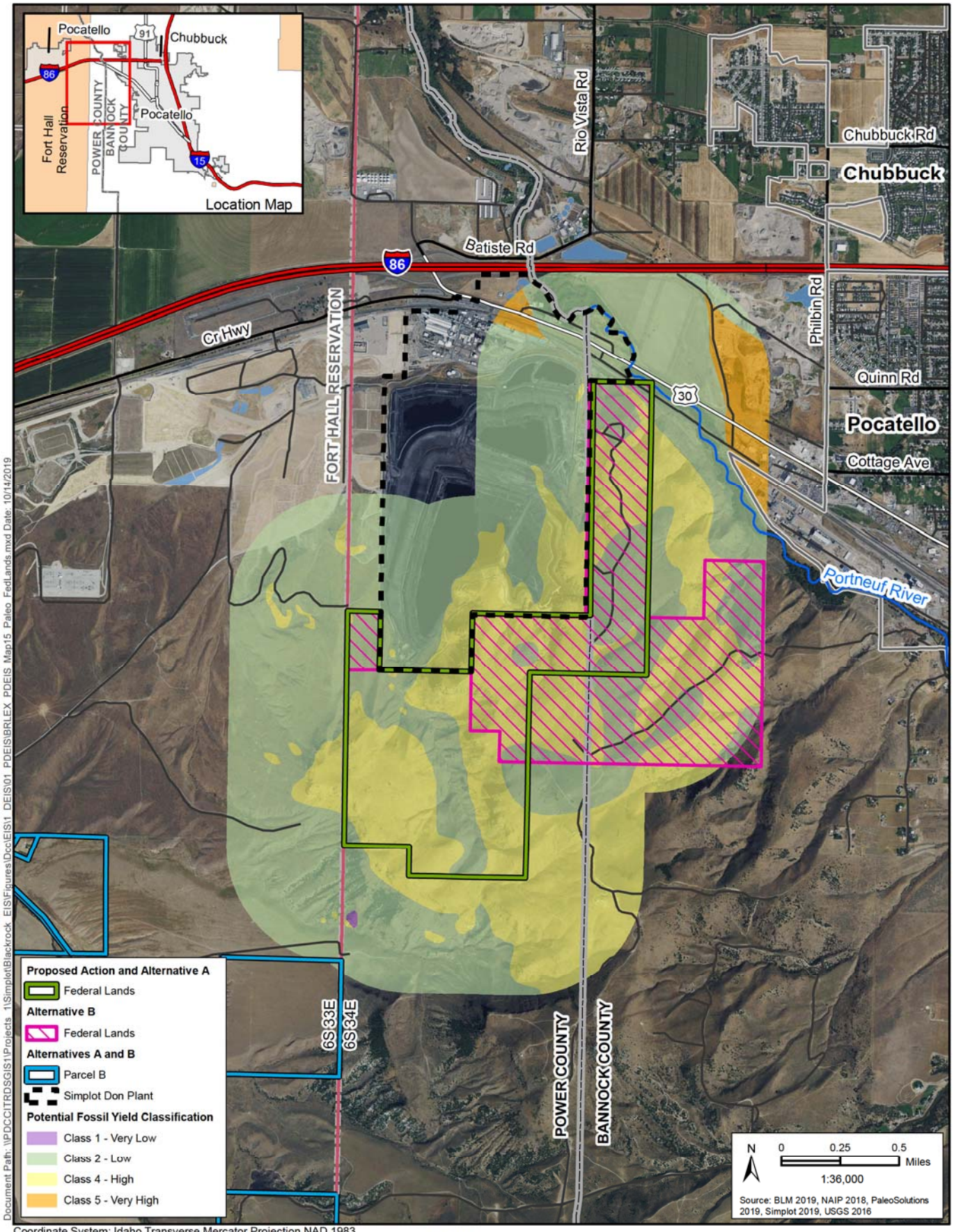
Map 14: Paleontology - Potential Fossil Yield Classification Non-Federal Lands and Parcel A



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Coordinate System: Idaho Transverse Mercator Projection NAD 1983

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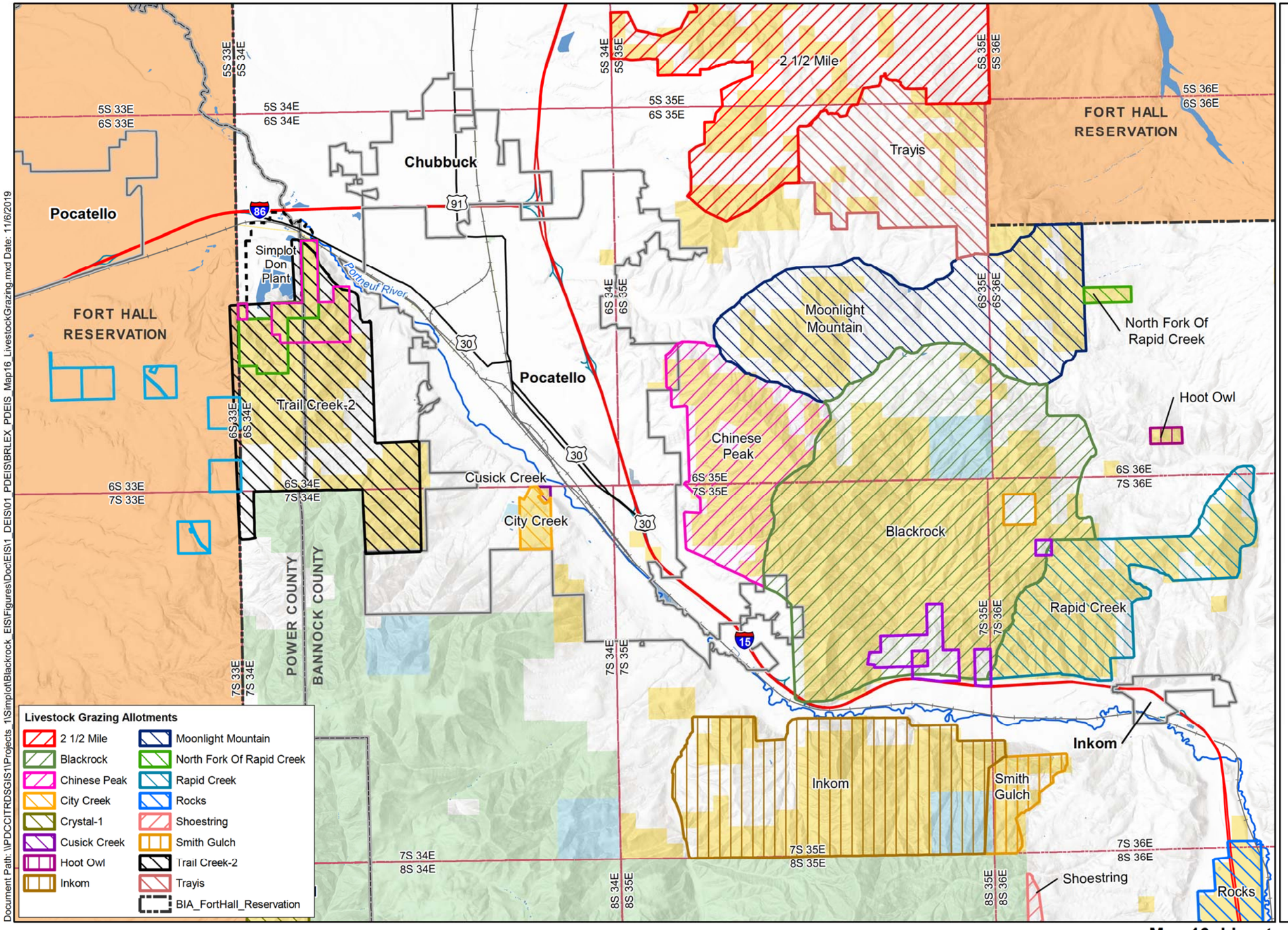
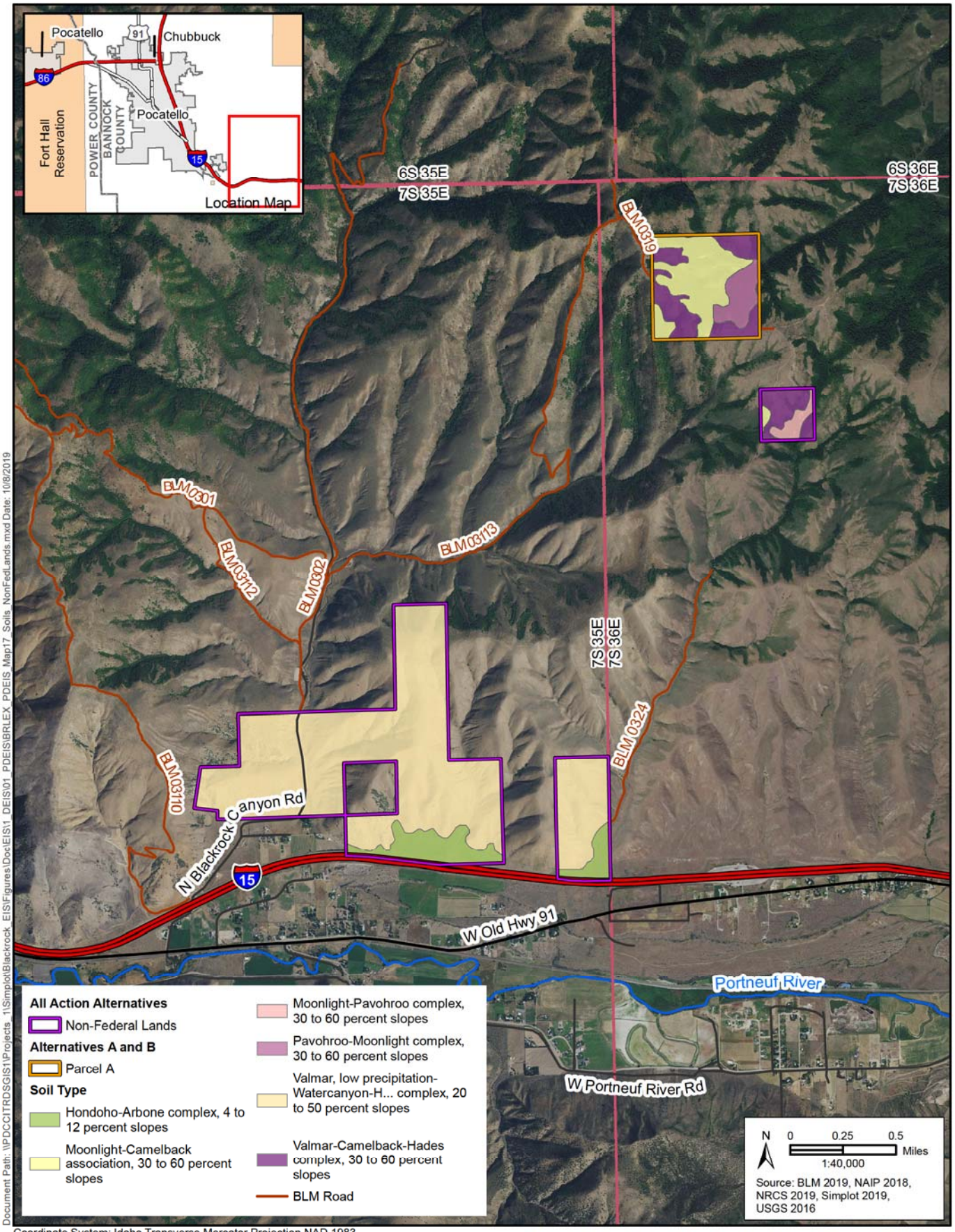
Map 15: Paleontology - Potential Fossil Yield Classification Federal Lands



Map 16: Livestock Grazing - Grazing Allotments



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Coordinate System: Idaho Transverse Mercator Projection NAD 1983

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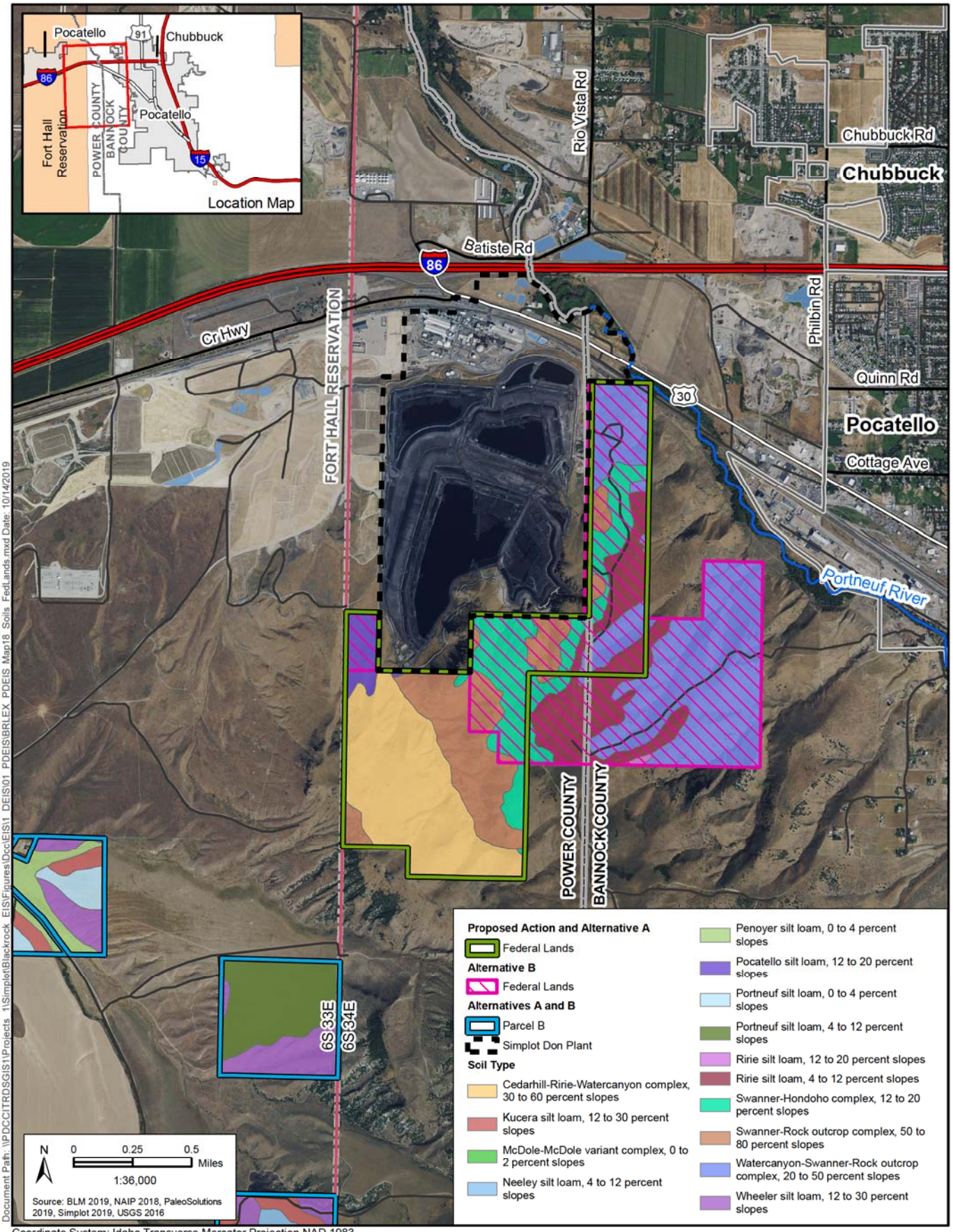
Map 17: Soils - Non-Federal Lands and Parcel A



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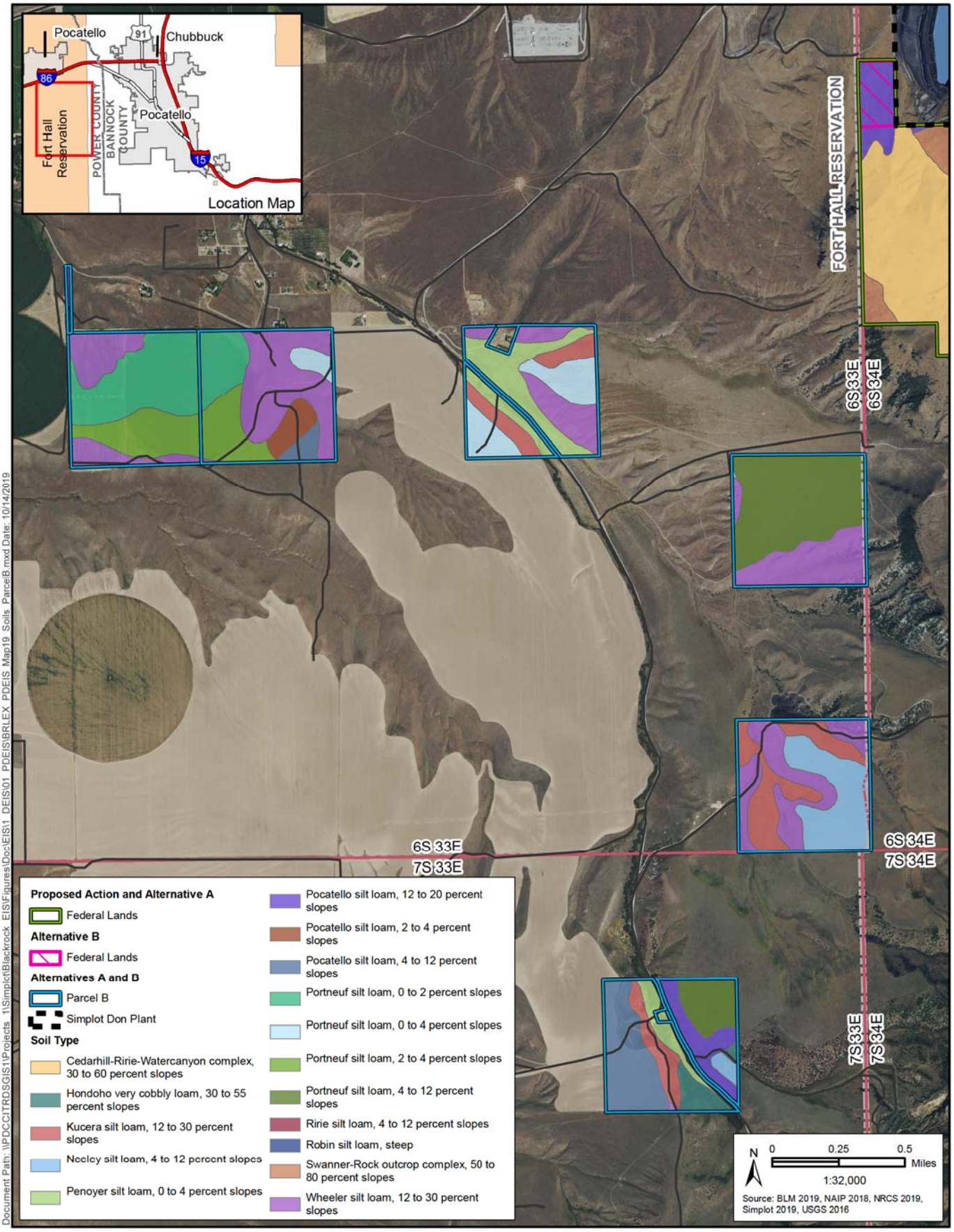
No warranty is made by the Bureau of Land Management. The accuracy, reliability, or completeness of these data for individual use or aggregate use with other data is not guaranteed.

Map 18: Soils - Federal Lands



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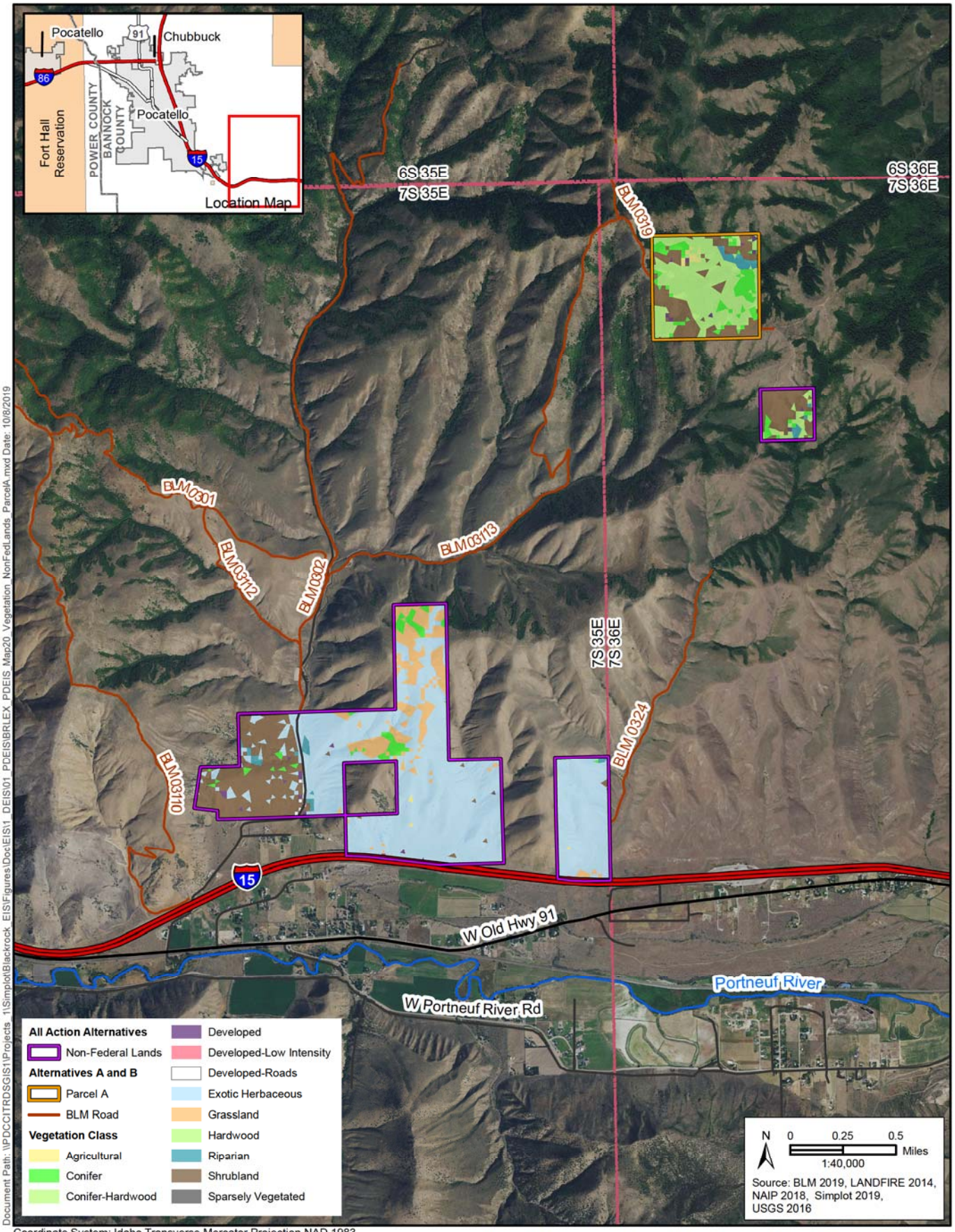
No warranty is made by the Bureau of Land Management. The accuracy, reliability, or completeness of these data for individual use or aggregate use with other data is not guaranteed.

Map 19: Soils - Parcel B



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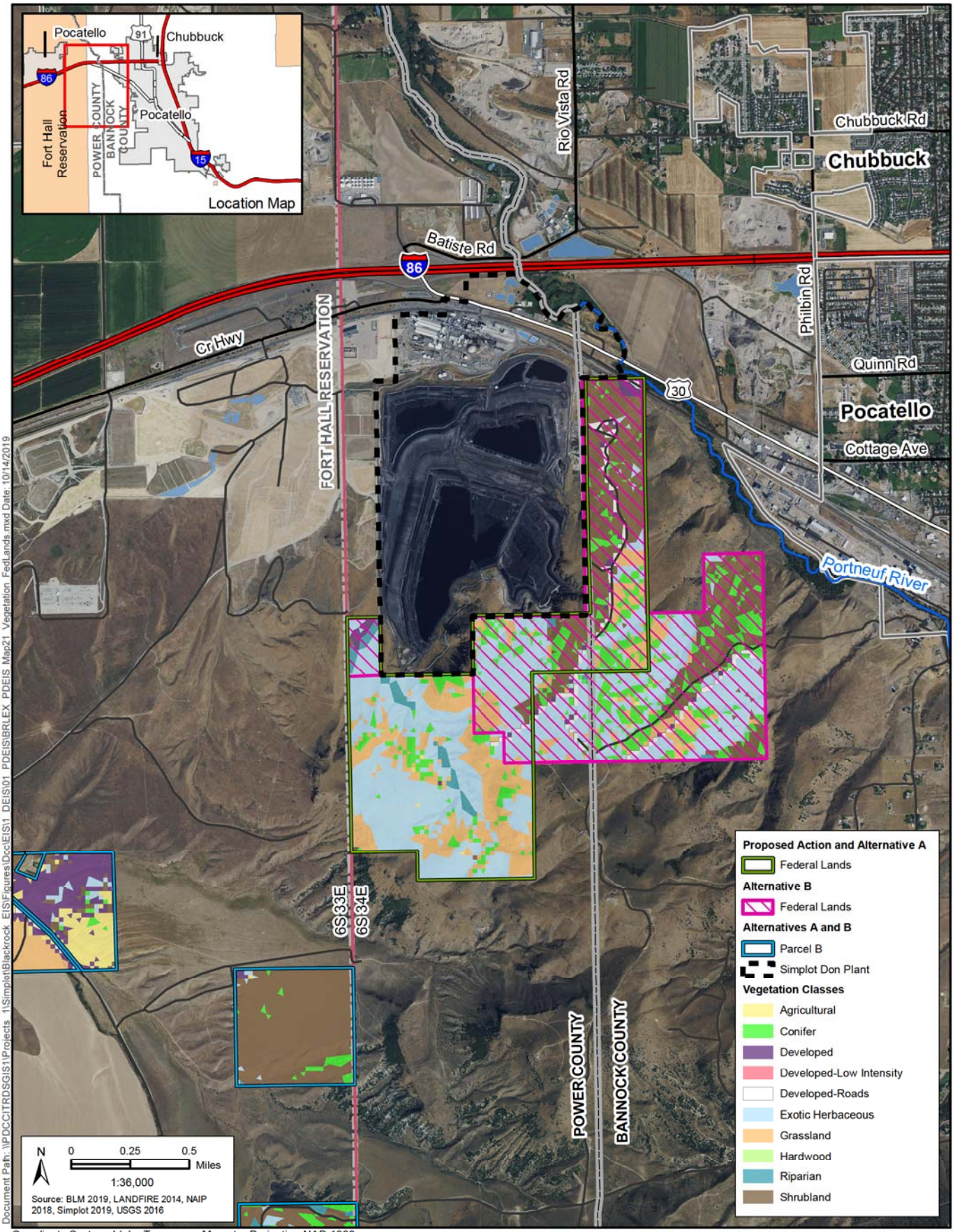
Coordinate System: Idaho Transverse Mercator Projection NAD 1983

No warranty is made by the Bureau of Land Management. The accuracy, reliability, or completeness of these data for individual use or aggregate use with other data is not guaranteed.

Map 20: Vegetation - Non-Federal Lands and Parcel A



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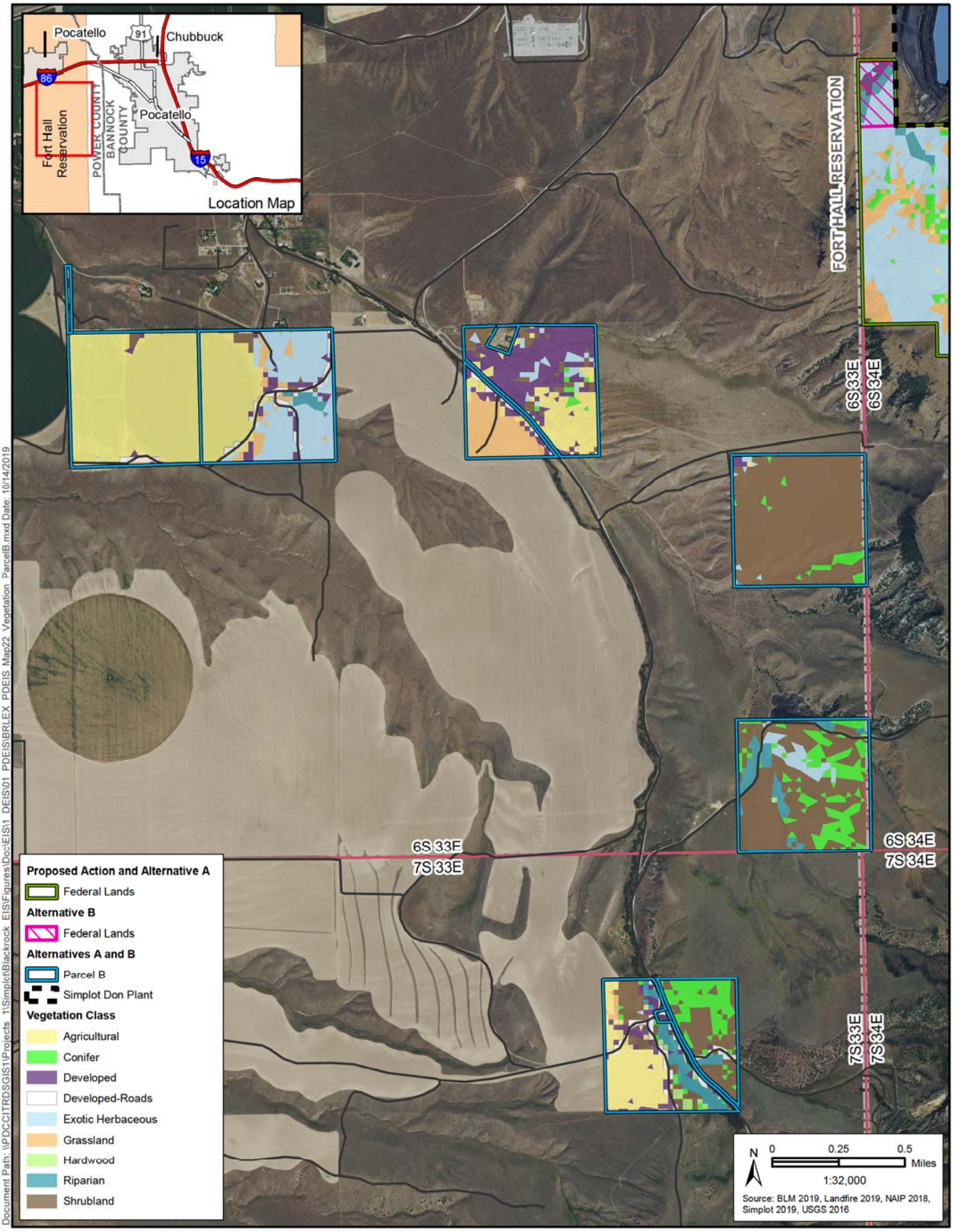
No warranty is made by the Bureau of Land Management. The accuracy, reliability, or completeness of these data for individual use or aggregate use with other data is not guaranteed.

Map 21: Vegetation - Federal Lands



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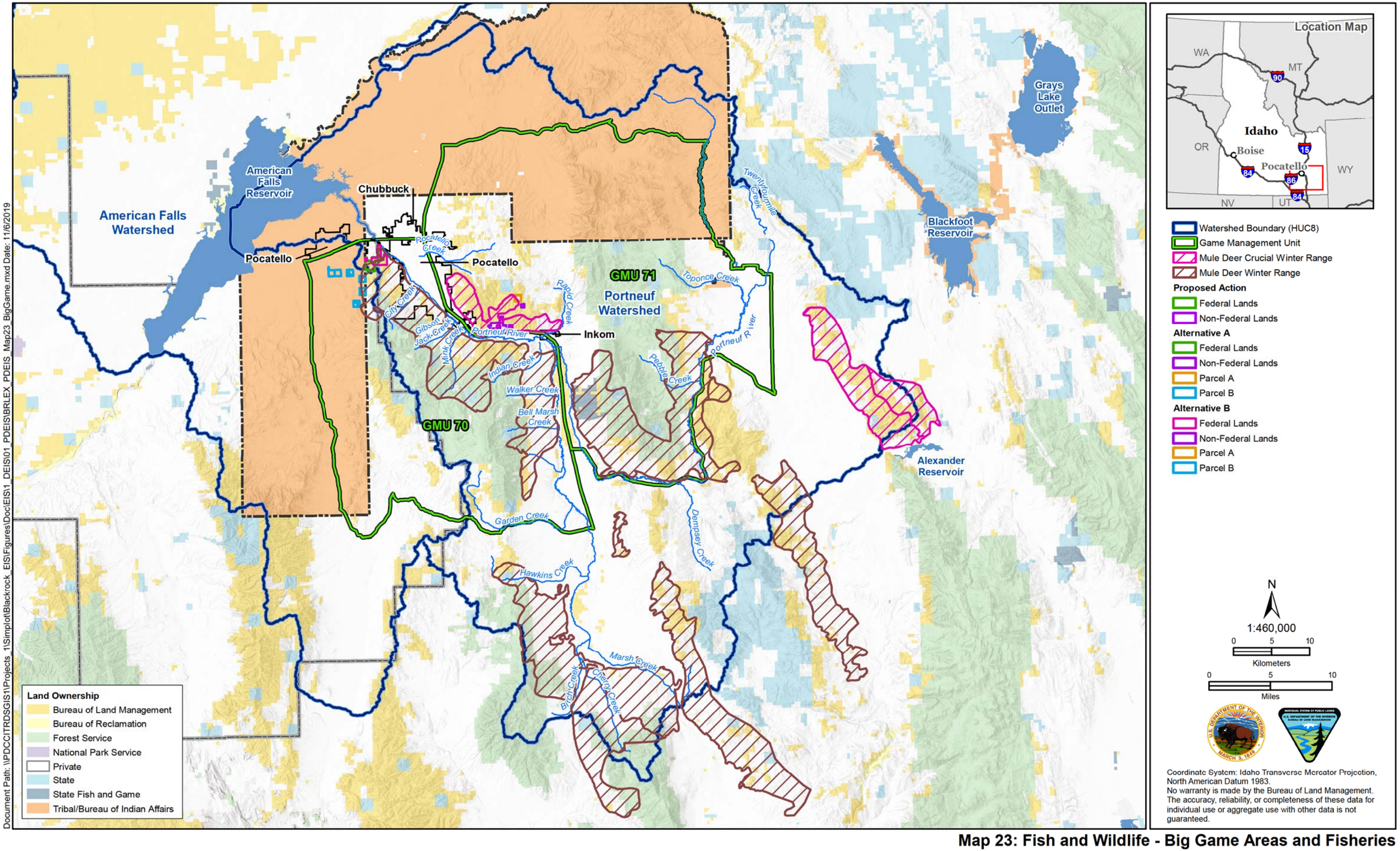
Coordinate System: Idaho Transverse Mercator Projection NAD 1983
No warranty is made by the Bureau of Land Management. The accuracy, reliability, or completeness of these data for individual use or aggregate use with other data is not guaranteed.

Map 22: Vegetation - Parcel B



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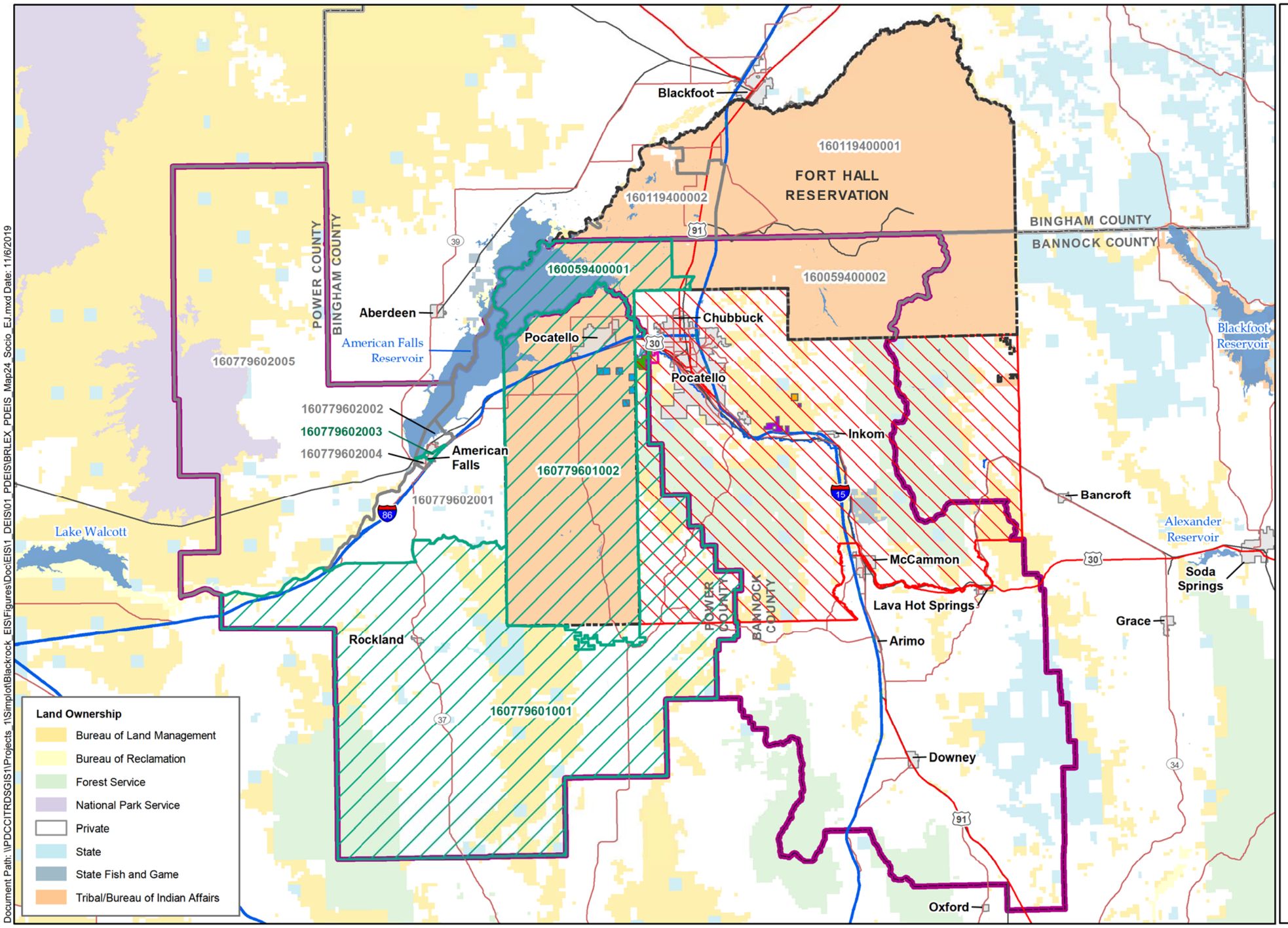
Map 23: Fish and Wildlife - Big Game Areas and Fisheries



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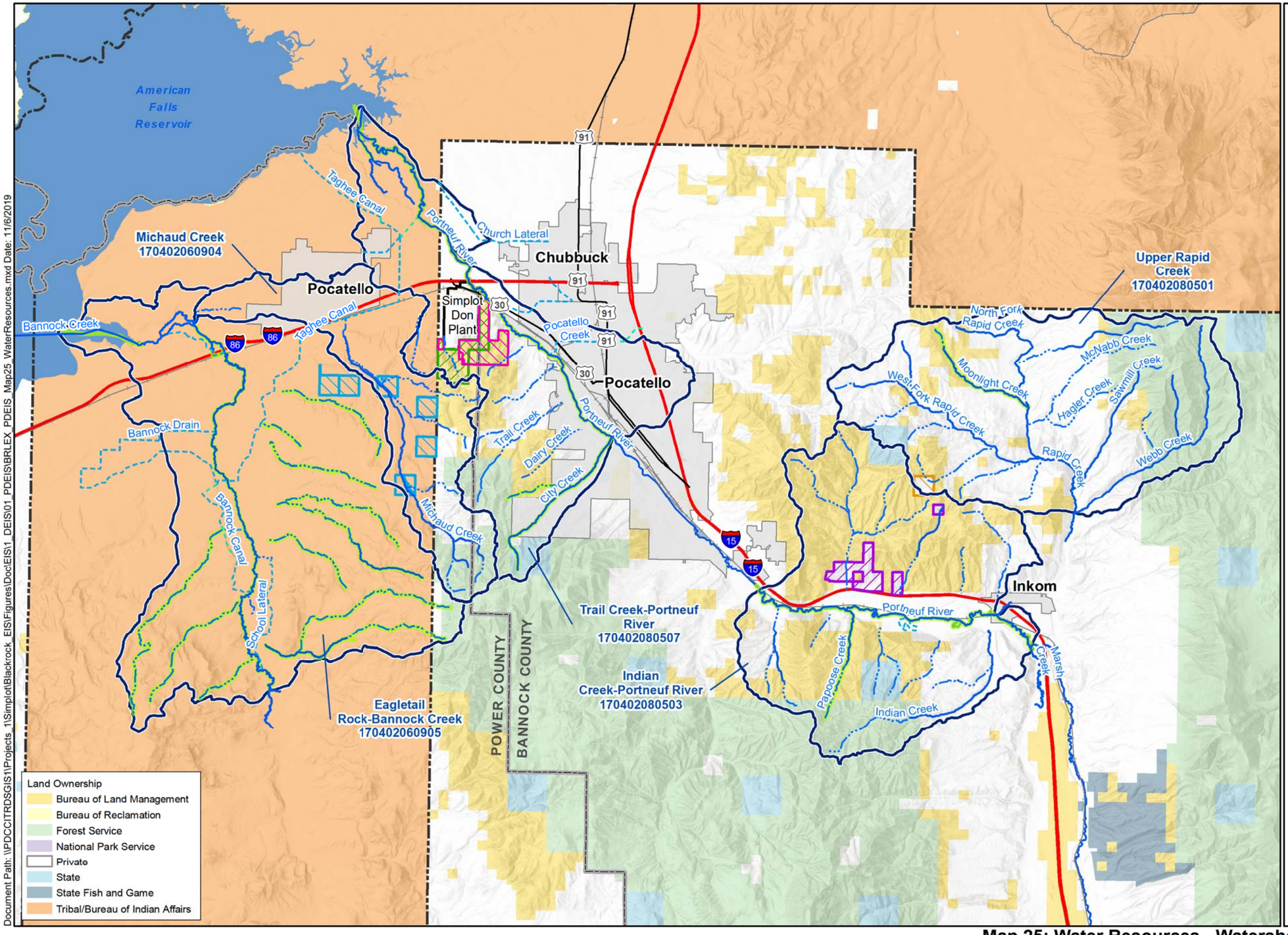
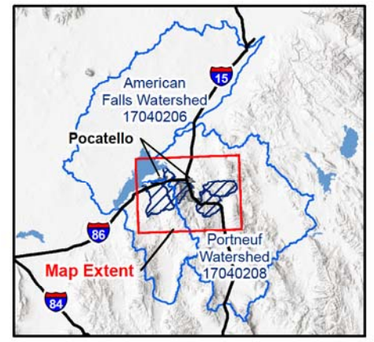
Map 24: Socioeconomics and Environmental Justice





Subwatershed Boundary (HUC12)
Perennial Stream
Intermittent Stream
Canal
Pipeline
Clean Water Act 303d Impaired Water

Proposed Action
Federal Lands
Non-Federal Lands

Alternative A
Federal Lands
Non-Federal Lands
Parcel A
Parcel B

Alternative B
Federal Lands
Non-Federal Lands
Parcel A
Parcel B

N

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Kilometers

0 2 4
Miles

Coordinate System: Idaho Transverse Mercator Projection, North American Datum 1983.
No warranty is made by the Bureau of Land Management. The accuracy, reliability, or completeness of these data for individual use or aggregate use with other data is not guaranteed.

Document Path: \\PDCCITRDSGIS1\Projects_1\SimplotBlackrock_EIS\Figures\Doc\EIS\1_DEIS\01_PDEIS\BRLEX_PDEIS_Map25_WaterResources.mxd Date: 11/6/2019

Map 25: Water Resources - Watersheds and Surface Water Features

Blackrock Land Exchange

Draft Environmental Impact Statement

Appendix D

BLM Interdisciplinary Team Checklist

Element of the Human Environment	Present Analyzed	Present Not Analyzed	Not Present	Rationale
Air Quality	X			The proposed land exchange would not directly affect air quality. However, ongoing emissions of criteria air pollutants and fluoride from continued and prolonged operation of the Don Plant, combined with emissions from reasonably foreseeable construction and operation activities on the Federal lands involved in the exchange, could affect air quality. The Federal lands are located within the Portneuf Valley particulate matter 10 microns or less in diameter (PM_{10}) Maintenance Area and directly adjacent to the Fort Hall PM_{10} Nonattainment Area. The Idaho Department of Environmental Quality (IDEQ) issued a Consent Order requiring reductions in fluoride and PM_{10} emissions from the Don Plant.
Climate Change	X			The proposed land exchange would not directly affect climate change. However, ongoing emissions of greenhouse gases from continued and prolonged operation of the Don Plant, combined with emissions from reasonably foreseeable construction and operation activities on the Federal lands involved in the exchange, would contribute to the regional and global budget of greenhouse gases in the atmosphere.
Cultural Resources	X			The Federal lands contain three known historic properties eligible for listing on the National Register of Historic Places. Transfer of historic properties out of Federal ownership through the proposed land exchange would constitute an adverse effect under 36 Code of Federal Regulations (CFR) 800.5(a)(2)(vii). Reasonably foreseeable actions on the Federal lands could result in permanent loss of these historic properties.
Tribal Treaty Rights and Trust Responsibilities	X			The proposed land exchange would result in a net loss of 52 acres of Federal lands available for exercise of off-reservation treaty rights. The 719 acres of the Federal lands would no longer be available for exercise of off-reservation treaty rights. The 667 acres of the non-Federal lands would become available for exercising off-reservation treaty rights. The Bureau of Land Management (BLM) will analyze potential effects on the Fort Hall Indian Reservation. Effects of the land exchange, in combination with those of other past, present, and reasonably foreseeable actions, could result in a cumulative loss of lands available for exercise of tribal treaty rights within the BLM Pocatello Field Office.
Geotechnical Stability	X			The proposed land exchange would not directly affect geotechnical stability. However, reasonably foreseeable development of the expanded gypsum stack and cooling ponds on the Federal lands presents a risk of failure and release of free liquid or flowable slurry if the geotechnical stability of the facilities is compromised by slope instability, seismic loading, overtopping, or other factors.

Element of the Human Environment	Present Analyzed	Present Not Analyzed	Not Present	Rationale
Hazardous or Solid Wastes	X			The Federal lands are within the Off-Plant Operational Unit of the Eastern Michaud Flats Superfund Site. The proposed land exchange would transfer lands known to contain contaminants of concern in vegetation and soils, and potentially groundwater, out of Federal ownership and to a potentially responsible party. Reasonably foreseeable development would result in storage and transport of Bevill Amendment-exempt wastes on the Federal lands from the Don Plant fertilizer manufacturing process.
Public Safety	X			The proposed land exchange would not directly affect public safety. However, reasonably foreseeable development of cooling ponds on the Federal lands could create public safety hazards by contributing to the formation of fog and ice on Interstate 86, U.S. Highway 30, and other areas with public access. Other potential effects on public health and safety will be addressed in relation to other critical elements such as air quality, geotechnical stability, hazardous or solid wastes, recreation, soils, vegetation, and water quality.
Recreation	X			The proposed land exchange would result in a net loss of 52 acres of public land within the Pocatello Special Recreation Management Area (SRMA), West Bench Recreation Management Zone (RMZ). The 719 acres of the Federal land would no longer be available for dispersed recreation. The 667 acres of the non-Federal land would be available for recreation opportunities and would secure permanent legal access to the approximately 15,000 acres of public land within the Pocatello SRMA, Blackrock RMZ. The Blackrock RMZ contains approximately 40 miles of designated off-highway vehicle trails and numerous developed recreation facilities. Transfer of the non-Federal lands into BLM administration would allow the establishment of legal access to designated routes T0351, T0352, and 0324, where the routes traverse the non-Federal lands, and would provide additional access to the BLM's Chinese Peak-Blackrock Trail System.
Visual Resources	X			The Federal lands would not be subject to BLM visual resource management (VRM) after the proposed land exchange, which would allow for a higher degree of visual change. Reasonably foreseeable actions for facilities supporting the Don Plant are likely to result in a high degree of visual change from certain observation points. The non-Federal lands would be managed as VRM Class III and IV objectives, which are consistent with adjacent Federal lands.
Lands and Realty	X			The proposed land exchange would result in the loss of public access to the Federal lands, but would establish additional legal public access to the non-Federal lands. The land exchange will require transfer or reservation of existing right-of-way authorizations encumbering both the Federal and non-Federal lands. Some existing authorized facilities on the Federal lands may need to be relocated to accommodate reasonably foreseeable actions on the parcel.

Element of the Human Environment	Present Analyzed	Present Not Analyzed	Not Present	Rationale
Livestock Grazing	X			The Federal lands would no longer be available for livestock grazing after being transferred out of Federal ownership, resulting in a loss of animal unit months (AUMs) within the Trail Creek-2 grazing allotment. There are no rangeland improvement projects on the Federal lands. The non-Federal lands acquired in the proposed exchange would be administered by the BLM within the Blackrock grazing allotment. No changes to AUMs or grazing management within the Blackrock allotment would occur. To the BLM's knowledge, there are no rangeland improvement projects located on the non-Federal lands.
Wildlife	X			The proposed land exchange would result in a net increase in the acreage of mule deer crucial winter range under BLM administration within the Pocatello Field Office, specifically the Blackrock big game winter range area. Additionally, the BLM anticipates consolidation of land administration within the crucial winter range. Reasonably foreseeable development of the Federal lands would remove existing wildlife habitat used by mule deer and other wildlife species. In spring 2019, a BLM biologist documented three large stick nests on cliff substrate on the Federal lands, one of which was occupied by an incubating golden eagle. The BLM will conduct additional wildlife surveys on the Federal and non-Federal lands in spring 2019, primarily to determine occupancy by breeding raptors.
Fish and Fisheries	X			The proposed land exchange may have an effect on fisheries. There is potential for effects on fisheries in the Portneuf River, largely through water quality impacts from phosphorous introduction via overland runoff and groundwater contribution from reasonably foreseeable actions. It is anticipated that J.R. Simplot Company's (Simplot's) compliance with obligations under the U.S. Environmental Protection Agency Record of Decision and IDEQ Consent Order for the Eastern Michaud Flats Superfund Site would limit the potential additional adverse effects of reasonably foreseeable actions on downstream fish and fisheries relative to existing baseline levels.
Soils	X			The Federal lands are within the Off-Plant Operational Unit of the Eastern Michaud Flats Superfund Site. The proposed land exchange would transfer soils known to contain contaminants of concern out of Federal ownership and to a potentially responsible party. Reasonably foreseeable actions would result in soil disturbance, compaction, loss of productivity, removal, erosion, and other effects on the Federal lands.

Element of the Human Environment	Present Analyzed	Present Not Analyzed	Not Present	Rationale
Vegetation	X			The Federal lands are within the Off-Plant Operational Unit of the Eastern Michaud Flats Superfund Site. The proposed land exchange would transfer fluoride-contaminated vegetation out of Federal ownership and to a potentially responsible party. The proposed land exchange would also change areas subject to BLM vegetation treatments and management of noxious weeds. Reasonably foreseeable actions would result in removal of vegetation from the Federal lands. The Federal and non-Federal lands will be surveyed for special status plant species in spring or summer 2019.
Wetlands and Riparian Zones	X			The Portneuf River is a perennial river that flows through the northeast corner of the Federal lands (approximately 100 feet) and supports a band of dense riparian vegetation. Field surveys identified one spring on the non-Federal lands. Reasonably foreseeable actions on the Federal lands are not anticipated to directly affect this area, but it could experience indirect effects from phosphorous introduction via overland runoff and groundwater contribution. Intermittent streams and springs on the non-Federal lands would be subject to BLM management intended to maintain riparian habitats in proper functioning condition after being transferred to Federal ownership.
Water Quality	X			The Federal lands are within the Off-Plant Operational Unit of the Eastern Michaud Flats Superfund Site with documented water quality issues. Reasonably foreseeable actions on the Federal lands could release additional contaminants into surface and groundwater, but would be subject to an existing IDEQ Consent Order establishing limits for phosphorus loading to the Portneuf River.
Socioeconomics and Environmental Justice	X			The proposed land exchange would change contributions to the tax bases of Bannock and Power Counties and payments in lieu of taxes the counties receive from the Federal Government. Reasonably foreseeable actions on the Federal lands would result in cumulative economic effects from the continued and prolonged operation of the Don Plant, its associated workforce, and economic activity generated by operational costs and expansion of Don Plant facilities. Reasonably foreseeable actions have the potential to contribute to disproportionately adverse effects on the Shoshone-Bannock Tribes, a minority and low-income population.
Geology	X			The proposed land exchange would not directly affect geology. However, the geology of the Federal lands is considered in assessing the geotechnical stability of reasonably foreseeable facilities and migration of groundwater and possible contaminants from the facilities. These geologic considerations are addressed in the *Geotechnical Stability* and *Water Quality* sections.

Element of the Human Environment	Present Analyzed	Present Not Analyzed	Not Present	Rationale
Paleontology	X			The Federal lands contain an area of Potential Fossil Yield Classification (PFYC) 4 (high potential). The approximately 449 acres of Federal land area with a PFYC of 4 are associated with the Starlight Formation, which has been known to yield moderately diverse and scientifically important assemblages of fossil mammals. The proposed land exchange would transfer this area potentially containing paleontological resources out of Federal administration to a private party. Construction of the reasonably foreseeable actions of the gypsum stack expansions and the cooling ponds would result in an estimated disturbance of 140 acres in PFYC 4 on the Federal lands that could affect paleontological resources.
Threatened and Endangered Species			X	The Federal and non-Federal lands are not within any special status species priority areas and the U.S. Fish and Wildlife Service has not identified any threatened or endangered wildlife, fish, or plants as occurring or potentially occurring. Due to the lack of any occurring or potentially occurring threatened or endangered wildlife species, potential impacts on Endangered Species Act–listed species would not occur and these species are not further analyzed in this Environmental Impact Statement.
Minerals		X		Currently, there no active mining claims, fluid mineral leases, solid mineral leases, or salable mineral authorizations within the Federal lands. The Federal and non-Federal lands proposed for exchange have low development potential for salable and locatable mineral resources and have no known mineral values for fluid and solid leasable mineral resources. Both lands are also prospectively valuable for oil and gas. The proposed land exchange would transfer the mineral estates associated with both the Federal and non-Federal lands. The mineral estate associated with the Federal lands would no longer be managed by the BLM. As per the Federal Land Policy and Management Act of 1976 Section 206(i)(2), the mineral estate within the non-Federal lands would be open to operation of public land laws and to entry, location, and patent under the mining laws following a 90-day segregation after the date of acceptance of title. 43 CFR 3501.5 defines acquired lands as lands or interests in lands, including mineral estates that the United States obtained through purchase, gift, or condemnation. Should the BLM decide to accept Parcel A, the mineral estate within the parcel would be managed as leasable minerals per 43 CFR 3501.1(a)(2) and the Mineral Leasing Act for Acquired Lands of 1947. Authorization of prospecting permits is discretionary per 43 CFR 3505.50(a) and issuance of Preference Right Leases could be rejected if mining is not the preferred use of the lands per 43 CFR 3507.19(b). As per 43 CFR 2091.8, the lands would not become subject to applicable land and mineral laws unless and until an order to that effect is issued by the BLM.

Element of the Human Environment	Present Analyzed	Present Not Analyzed	Not Present	Rationale
Noise		X		The proposed land exchange would not directly affect ambient noise levels. Noise from reasonably foreseeable actions on the Federal lands is not anticipated to notably change ambient noise levels at any nearby noise receptors, such as residences and the Fort Hall Reservation, relative to existing ambient noise from the ongoing operation of the Don Plant. Potential effects of noise on wildlife and other resources are discussed in those respective resource sections.
Existing and Potential Land Uses		X		Existing right-of-way authorizations are addressed in the *Lands and Realty* section; livestock grazing is addressed in the *Livestock Grazing* section.
Travel and Transportation		X		All applicable effects on travel and transportation are addressed in the *Recreation* and *Lands and Realty* sections.
Floodplains		X		"Zone A" floodplains designated by the Federal Emergency Management Agency are present adjacent to the Portneuf River within the Federal lands. None of the alternatives or reasonably foreseeable actions would involve construction of structures in, modification of, or Federal occupancy of the floodplain. In accordance with Executive Order 11988, there would be no alteration of the floodplains' function, risk of loss of Federal facilities due to flooding, or impact on human safety from flooding.
Special Designations			X	Not present and not affected.
Farmlands, Prime or Unique			X	Not present and not affected.
Forest Resources			X	Not present and not affected.
Wild Horses and Burros			X	Not present and not affected.
Wilderness/Wilderness Study Areas			X	Not present and not affected.

Note: "Federal lands" are the lands requested by Simplot that would be transferred to private ownership with approval of the land exchange. "Non-Federal lands" are the lands offered by Simplot that would be transferred to the BLM with approval of the land exchange.

Blackrock Land Exchange

Draft Environmental Impact Statement

Appendix E

Feasibility Study

Feasibility Study to Support Cooling Ponds and Gypsum Stack Expansion

Pocatello, Idaho

July 2018

Prepared for
J.R. Simplot Company

Feasibility Study to Support Cooling Ponds and Gypsum Stack Expansion

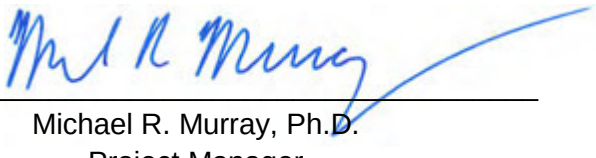
for

J.R. Simplot Company

Prepared by:

HDR, Inc.
412 East Parkcenter Boulevard, Suite 100
Boise, Idaho 83706

July 2018



Michael R. Murray, Ph.D.
Project Manager

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Appendices

Acronyms

µg/m^3	micrograms per cubic meter
ACC	acceptable ambient concentration
AERMOD	air dispersion model
BLM	Bureau of Land Management
CO	consent order
EA	environmental assessment
EIS	environmental impact statement
EMF	Eastern Michaud Flat Superfund Site
FPC	fluoride process condensate
FMC	FMC Corporation
FS	Feasibility Study
HDPE	high density polyethylene
Hwy 30	Highway 30
I-86	Interstate 86
IDEQ	Idaho Department of Environmental Quality
NEPA	National Environmental Policy Act
NOV	notice of violation
RAP	remedial action plan
ROD	record of decision
Simplot	J.R. Simplot Company
USEPA	U.S. Environmental Protection Agency

1 Introduction

This feasibility study (FS) evaluates the J.R. Simplot Company's (Simplot) additional land needs to continue operations at the Don Plant, a phosphate fertilizer manufacturing facility near Pocatello, Idaho (**Figure 1-1** and **Figure 1-2)**. Simplot needs land for the following:

- Cooling Ponds - Additional land is needed to construct cooling ponds, which will replace cooling towers. The ponds would reduce fluoride emissions as required by an agreement between Simplot and the Idaho Department of Environmental Quality (IDEQ).
- Gypsum Storage Expansion - Additional land is needed to expand Simplot's existing gypsum storage facility (referred to as gypsum stack or gypstack) to meet future production storage needs. Simplot currently stores gypsum on private property (Don Plant).

1.1 Project Objective

The overall goal of this FS is to review Simplot's current and future land needs and assess available options to support ongoing operations at the Don Plant. Land options and Simplot's proposed actions include federal lands managed by the Pocatello Field Office, Bureau of Land Management (BLM). This study evaluates project needs (Don Plant operations), design elements and system requirements, potential locations, regulatory requirements, and land alternatives. It is proposed to serve as the basis for the BLM to pursue a land exchange, sale, or lease with Simplot to support cooling pond construction and future gypsum stack expansion.

1.2 Project Needs

1.2.1 Proposed Cooling Ponds

Simplot currently operates cooling towers at the phosphoric acid plant within the boundaries of the Don Plant. The towers cascade contact cooling water over packing to increase air contact and transfer heat load to the surrounding air through sensible heat transfer or evaporation. The cooling towers are considered a source of fluoride emissions. IDEQ issued a notice of violation (NOV) on February 12, 2013, to Simplot for violations of the fluoride forage standards (Idaho Administrative Procedures Act [IDAPA] 58.01.01.577.06), where fluoride concentrations in off-site forage samples exceeded standards. In response to the NOV, Simplot and IDEQ entered into a consent order (CO) on June 16, 2016 (Case No. E-2012.0022), requiring Simplot to reduce fluoride emissions from the Don Plant by one of the following methods (Section 10.A of the CO):

- Replace the existing reclaim cooling towers with a low emission alternative; or
- Incorporate measures that provide for greater than 50 percent fluoride emissions reductions from the reclaim cooling towers to demonstrate compliance with the fluoride in forage standards.

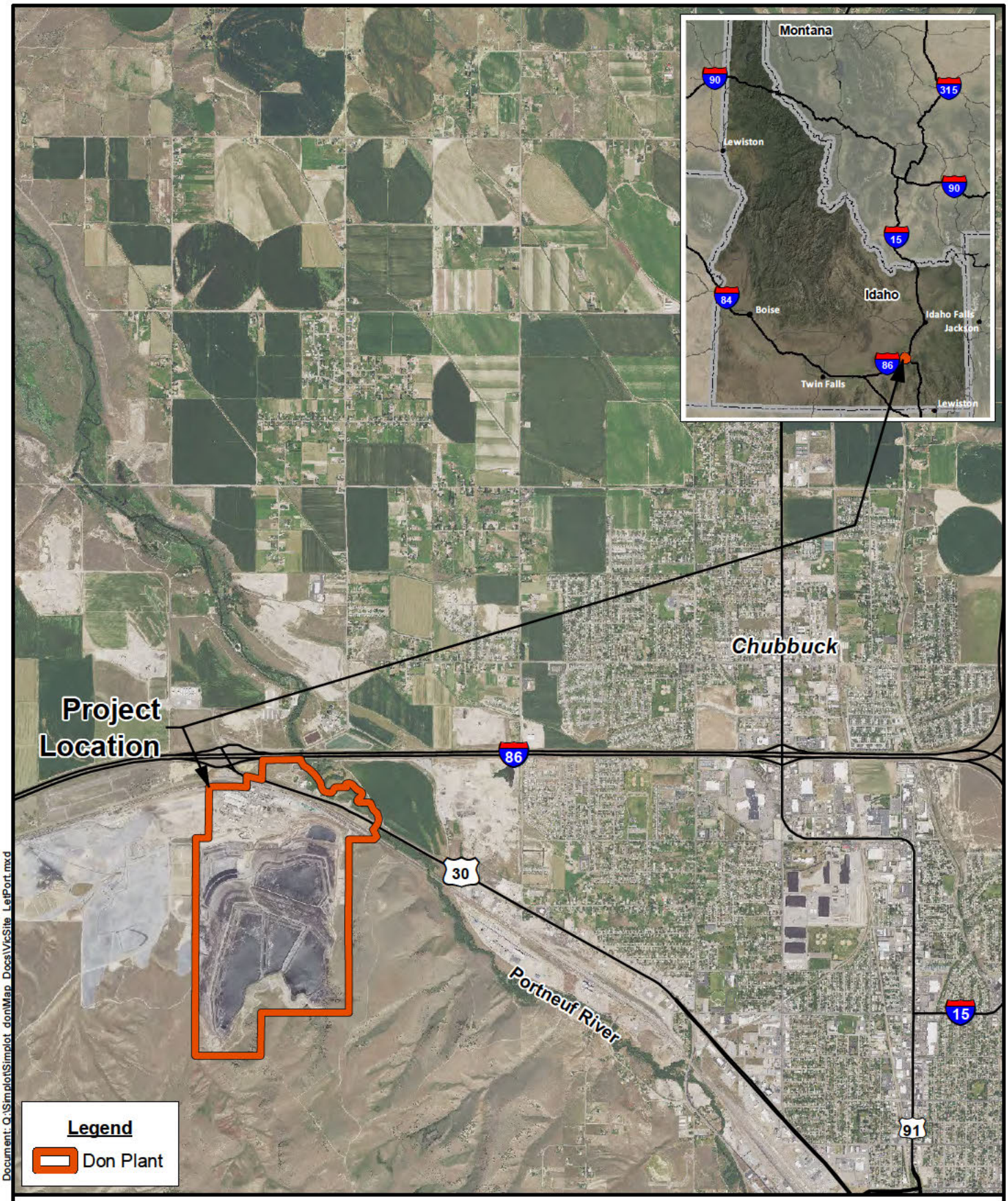
Simplot has evaluated alternatives for reducing fluoride emissions and has determined that cooling ponds are the most appropriate method for reducing fluoride emissions, while also continuing to meet operational requirements at the Don Plant facility. Simplot would use the ponds for heat transfer of the cooling circuit water rather than the cooling towers. The hot water would be pumped to the ponds, allowed to cool, and then returned to the cooling water circuit to be used again in a closed loop system (see Section 2 for details on the cooling ponds).

The implementation of cooling ponds would allow Simplot to meet the CO for replacing the existing reclaim cooling towers with a low emission alternative.

1.2.2 Proposed Gypsum Stack Expansion

Phosphogypsum is a byproduct of the chemical reaction that produces phosphoric acid. The gypsum is mechanically separated from the phosphoric acid and then mixed with process water for transport to a storage area located south and southeast of the plant site that abuts natural mountainous terrain to the south, known as the phosphogypsum (or gypsum) stack (**Figure 1-2**).

To meet future gypsum storage needs, Simplot must expand the gypsum stack laterally by placing the material on adjacent lands. If Simplot is unable to access additional land for suitable storage, the Don Plant would have to reduce production rates or even cease production altogether. A shutdown would be detrimental to the region's economy.



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Simplot Don Plant, Pocatello, ID
Feasibility Study

Figure 1-1

Vicinity Map

Imagery: 2015 NAIP, 1 meter resolution
Source: USDA/NRCS Digital Gateway
Other Data Sources: INSIDE Idaho, Idaho Transportation Department; USGS

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Feet

Map ID	Owner
1	FMC Corporation
2	Simplot J.R. Company
3	Simplot Leasing Corp.
4	Ruby Company
5	Simplot J.R. Company
6	Northwest Pipeline Corporation
7	Simplot Industries Inc
8	Bannock County
9	Bannock County
10	Michaud Creek Ranches
11	Bannock County
12	Simplot Industries Inc

Imagery: 2016 1 foot resolution; Source: Simplot
2017 1 meter resolution; Source USDA/NRCS Digital Gateway
Other Data Sources: Inside Idaho; USGS; BLM; Bureau of Indian Affairs; Power County; Bannock County

Map Date: 4/17/2018

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Figure 1-2. Land Ownership Map
Feasibility Study
Simplot Don Plant, Pocatello ID

2 Baseline Information

2.1 General Site Setting

The Don Plant operations are located in sections 7 and 18 of Township 6 South, Range 34 East, just west of Pocatello, Idaho (**Figure 1-1**). The plant is located at the base of the northern slope of the Bannock Range and along the western flank of the Portneuf Valley, where the range and river valley merge with the Snake River Plain in the area known as Michaud Flats. The Don Plant processing facility and gypsum stack areas are at the base of the Bannock Range where subsurface deposits represent a combination of materials derived from range erosion and materials deposited by the Portneuf River. Elevation of the Don Plant ranges from 4,450 to 5,000 feet above mean sea level (**Figure 2-1**).

Simplot conducted an investigation, under the jurisdiction of the U.S. Environmental Protection Agency (USEPA), into the original unlined gypsum stack system for potential environmental impacts to soil, air, surface water, and groundwater as part of the Eastern Michaud Flat Superfund Site (EMF). The investigation resulted in a June 1998 Record of Decision (ROD) requiring Simplot to reduce phosphorus loading in ground and surface water. In response to the ROD, Simplot initiated a multi-phase construction project to fully line the existing facility with the primary design objective of providing full containment of byproduct gypsum, associated process waters, and any runoff from active portions of gypsum storage area (Simplot 2015). The lining projects have included installing an impervious high density polyethylene (HDPE) liner on top of the stack and portions of the adjacent natural ground surface that allow continued use of the facility by stacking and vertical expansion of gypsum on top of the lined areas. From 2018 onward through the projected life of the current stack, several liner extensions or “raises” will be required to extend liner up adjacent slopes as the various phases grow vertically.

2.2 Process Water Cooling Operations

2.2.1 Phosphoric Acid Production

Phosphate fertilizer is produced by first reacting phosphate ore with sulfuric acid. This exothermic reaction produces phosphoric acid in a concentration ranging from 26 to 32 percent, as well as a di-hydrate calcium sulfate solid (phosphogypsum). Elemental constituents (e.g., fluoride (F), calcium (Ca), aluminum (Al), iron (Fe), magnesium (Mg), and, silica (Si)) naturally present in the ore are found in the phosphoric acid and phosphogypsum in varying levels. The heat produced in the reaction is removed by flash cooling the phosphoric acid under a slight vacuum and by an air sweep over the reaction vessel. The vapors from the flash cooler are condensed in a direct contact heat exchanger (barometric condenser) and the vapors from the reaction vessel air sweep are partially condensed and cleaned of pollutants in a cross-flow scrubber.

The dilute phosphoric acid from the reaction system is subsequently concentrated through evaporation to achieve required concentrations for processing into various fertilizer or industrial products. The evaporation occurs under a slight vacuum in forced circulation evaporation units

using steam. As water is removed from the phosphoric acid, more volatile components (mostly fluoride compounds) as well as small amounts of liquid entrainment are also present in the vapor. The vapor stream from the evaporators is condensed using direct contact heat exchangers (barometric condensers). The direct contact heat exchange requires large circulating flows and results in the cooling medium containing various compounds present in the phosphoric acid that either volatilize or carry over in liquid droplets with the water vapor to be condensed.

Most of the heat load from the phosphoric acid plant is removed using cooling towers, with a portion of the heat load removed using the phosphogypsum stack system. Emissions from cooling towers include both vapor and liquid (entrainment /drift losses).

2.2.2 Phosphogypsum

The phosphogypsum produced in the reaction system is removed from the phosphoric acid using filtration. The phosphogypsum filter cake is sluiced with water and pumped to the lined gypsum stack for storage. The stack allows for the phosphogypsum to settle out, and the transport water is captured and returned to the production plant for reuse.

2.2.3 General Water Balance

A general process flow diagram and water balance for current operations is presented in **Figure 2-2.** Water input into the system comes from fresh water (on-site wells), extraction well water, and from the slurried phosphate ore piped to the Don Plant from Simplot's Smoky Canyon Mine in southeast, Idaho.

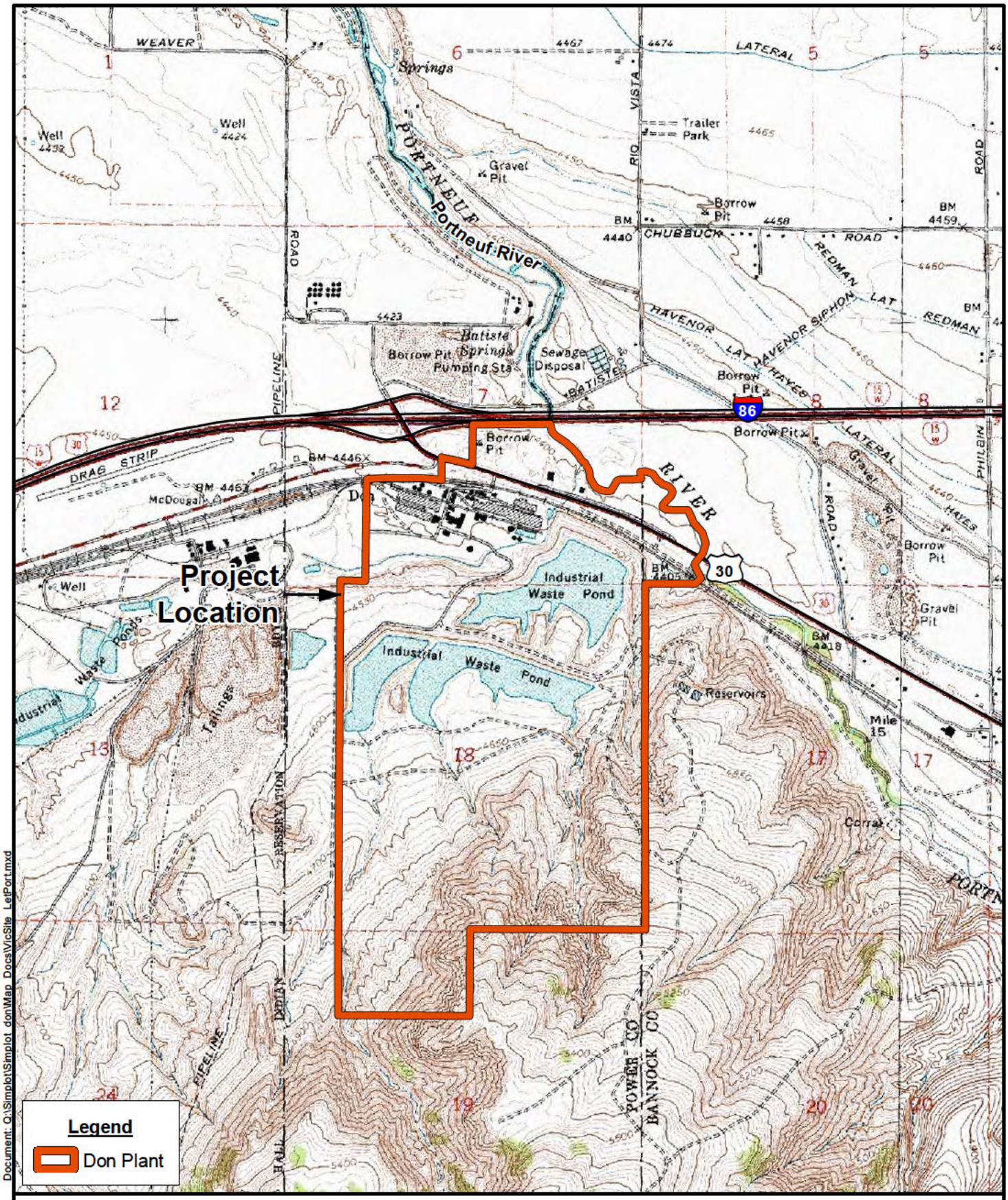
2.3 Gypsum Stack

The gypsum stack is located south and southeast of the processing facility and abuts natural mountainous terrain to the south (**Figure 1-1** and **Figure 2-1**).

2.3.1 Gypsum Stack Lining Project

The original gypsum stack system was unlined and became part of the USEPA's EMF superfund investigation and subsequent ROD requiring Simplot to reduce phosphorus loading to ground and surface water. Simplot has finished a liner installation project converting the unlined system to a lined and contained facility, with the primary objective of containing the byproduct gypsum, process water and runoff (Simplot 2015). The lining project has been conducted in six phases, which include the construction of two, lined decant ponds (**Figure 2-3**):

- Lined lower compartment (phase 1) – completed June 2011
- Lined north end of upper west compartment (phase 2) – completed October 2012
- Line south end of upper west compartment (phase 3) – completed October 2013
- West side of unlined upper east compartment (phase 4) – completed November 2014
- East side of unlined upper east compartment (phase 5) – completed November 2017
- Lateral expansion to extend the gypsum stack (phase 6) – completed October 2015
- Two lined decant ponds (east decant pond in 2009 and west decant pond in 2016)



Simplot Don Plant, Pocatello, ID
Feasibility Study

Figure 2-1

Topographic Map

Imagery: USGS 24k Topographic Map
Source: Idaho Department of Water Resources
Other Data Sources: INSIDE Idaho, Idaho Transportation Department; USGS

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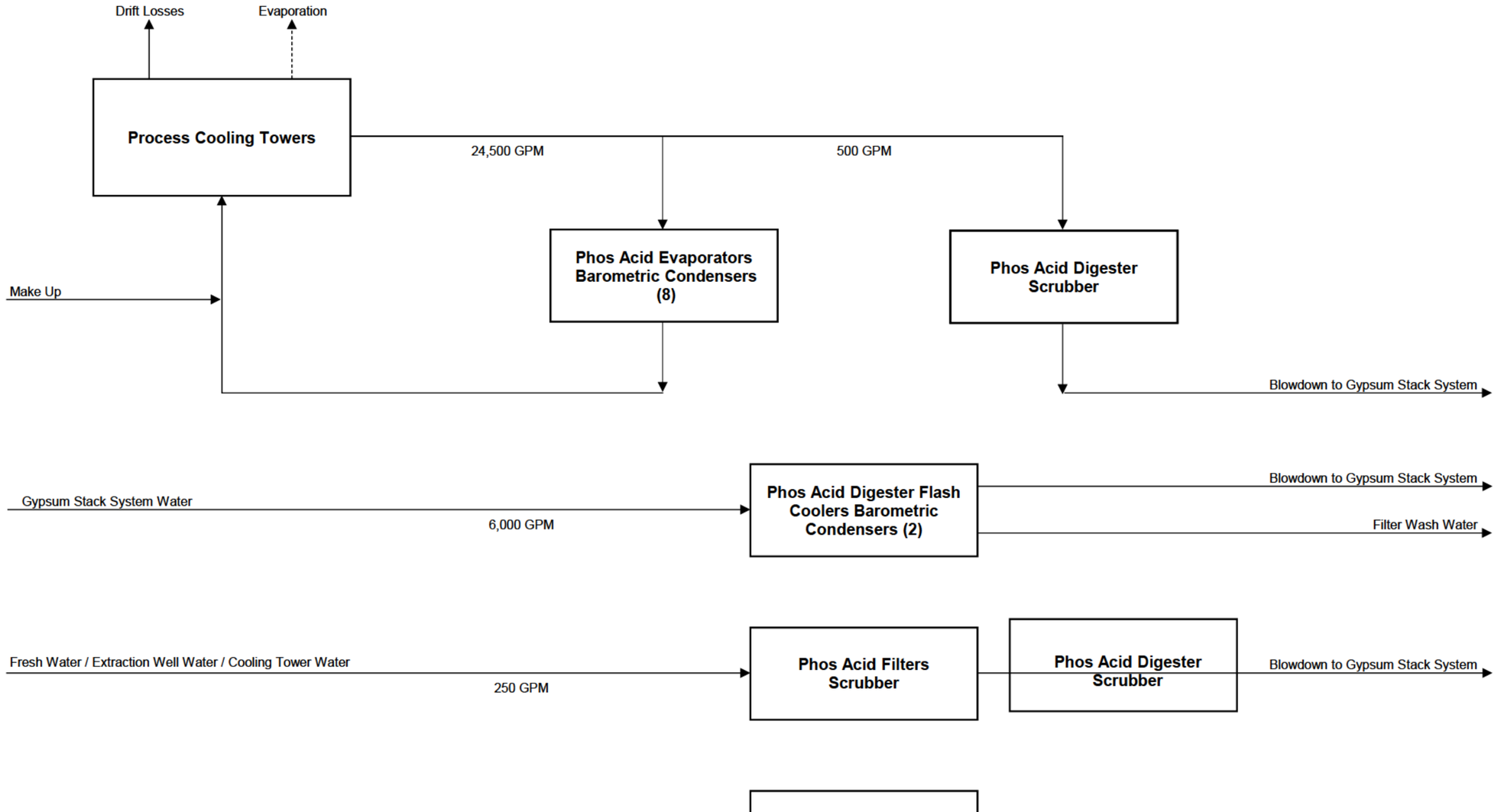
Feet



Notes:

1. Miscellaneous minor streams (vacuum pump seal water, pump seal water, etc…)

Simplot

AGRIBUSINESS GROUP POCATELLO, ID

REFERENCES NO.	DESCRIPTION

REVISIONS NO.	BY	DATE	DESCRIPTION	NO.	BY	DATE	DESCRIPTION

RESP	DATE
DRAWN BY:	
DESIGNED BY:	
CHECKED BY:	
APPROVED BY:	

Phosphoric Acid Plant

Process Cooling System (Existing)

Block Flow Diagram

Figure 2-2

SCALE: None

Revision

Figure 2-3. Gypstack Lining Projects (Phases 1 to 6)
Feasibility Study
Simplot Don Plant, Pocatello ID

The design elements for the storage compartments included preparation of the existing gypsum surface, installing 60-mil HDPE bottom liner; inner and starter dikes above liner; dike stabilization underdrains; header pipes and conduits to transfer collected seepage to the decant pond; a gypsum starter dike; lined perimeter flow channel for the control of surface water runoff, seepage, and decant return water flow (Ardaman & Associates 2017).

2.3.2 Gypsum Stack Operating Techniques

The gypsum stack is operated using a wet slurry technique, where gypsum filter cake is removed from the plant belt filters and slurried with recycled process water and pumped at 28 to 30 percent solids to a designated settling compartment on top of the lined gypsum stack area. The solids are allowed to settle in clarification ponds maintained on top of the stack, and the clarified process water (slurry water) is decanted or pumped back to the plant for reuse in subsequent slurry operations. The gypsum stack is operated and gradually raised using the upstream method of construction, in conjunction with a perimeter rim-ditch method of slurry distribution within the various clarification ponds. With this method, the settled gypsum deposits on top of the stack are periodically excavated from the perimeter rim-ditch system and used as fill to incrementally raise the perimeter containment dike and/or inner berm of the rim-ditch system.

2.3.3 Production Rate

Since Ardaman, the gypstack engineer of record, developed design assumptions in 2008 as part of the gypsum stack liner project, the Don Plant has experienced higher production rates and accelerated stack growth. A more recent study by Keller Associates recommends revising the gypsum production rates (Keller 2017a). Developing a high-level gypsum stack growth model, Keller Associates projects that the lined upper compartment (Phase 2, 3, 4, and 5) of the gypsum stack will reach design capacity by 2031 with the top of gypsum stack reaching an elevation of 5,005 feet above mean sea level if limited to Simplot's present Don Plant property (Keller Associates 2017b). The lower compartments (Phases 1 and 6) would still have capacity at this time, however additional compartments to distribute/manage gypsum slurry and process water may be needed to utilize this space. In order to maintain uninterrupted operation of the facility, the gypsum stack will need to be expanded in advance of the target date when the upper compartment reaches terminal elevation.

2.4 Land Exchange – Past Activities

In 1994, Simplot initiated activities with the BLM Pocatello Field Office to exchange private (offered) land for public (selected) land in order to expand their gypsum stack. At that time, Simplot was uncertain about their ability to place a liner and leachate collection system on top of the existing (unlined) gypsum stack and sought out additional land.

The purpose of the land exchange was for Simplot to obtain land adjacent to and south of the Don Plant (currently BLM land). As requested by BLM, the private land Simplot offered in exchange was in the Blackrock and Caddy Canyon areas (referred to as the Blackrock property), approximately 9 miles southeast of Pocatello.

BLM analyzed the proposed land exchange in an environmental assessment (EA) (under the National Environmental Policy Act [NEPA]). The exchange involved 719 acres of selected public land and 681 acres of offered private land. The Shoshone-Bannock Tribes contested the EA, published for public review in October 2006. In a May 2011 memorandum decision, the Federal District Court of Idaho held that the EA violated NEPA by failing to conduct a sufficient analysis and instructed BLM to prepare an environmental impact statement (EIS).

Since the court's decision in 2011, Simplot has expanded (Phase 6) its gypsum operations and added lined compartments for receiving gypsum, leachate collection systems, and lined decant ponds. This design, construction, and operational experience has provided Simplot important information and experience useful for expanding the gypsum stack operations onto off-site land such as the proposed south and east canyon areas, including: (1) the amount of waste that would be stored in the canyon south of the Don Plant; (2) preparation needed for waste storage; (3) the type of liner; (4) installation of the liner in the canyon terrain; and (5) information related to groundwater flows under the canyon. These issues are discussed more fully below.

3 Proposed Actions

This section describes Simplot's proposed expansion locations and conceptual designs for cooling ponds and gypsum stack expansion. Section 4 describes alternatives considered in siting the ponds and gypsum stack.

3.1 Replace Cooling Towers with Cooling Ponds

As described in Section 1.2.1, Simplot entered into a CO with IDEQ (Case No. E-2012.0022) requiring that Simplot reduce fluoride emissions from the Don Plant by either replacing the existing reclaim cooling towers with a low emission alternative or incorporating measures that provide for greater than 50 percent fluoride emissions reductions from the reclaim cooling towers with demonstration of compliance with the fluoride in forage standards. Simplot has conducted an assessment of alternatives and found that using lined cooling pond(s) to remove the heat load from the phosphoric acid plant is the preferred approach to meet the CO requirements. Simplot would transfer the process cooling water to cooling pond(s), where water would be cooled and then pumped back to the cooling system for reuse.

Based on conceptual level design and process water cooling studies, Simplot proposes to construct at least two ponds (cooling ponds 1 and 2) to the east of the gypsum stack (**Figure 3-1**). The area required for the cooling ponds (disturbance area including cut and fill) is approximately 80 to 100 acres (Simplot 2018). The range in area is due to potential design options, including using current gypsum stack ponds for cooling, blending tanks, and other related technologies. For planning purposes, 100 acres of pond disturbance area is assumed plus additional acreage for buffers around the ponds, access roads, and related infrastructure.

Figure 3-2 presents a process flow diagram and water balance illustrating the conceptual cooling pond system. Ponds 1 and 2 would be located on both Simplot and BLM land. **Table 3-1** summarizes approximate disturbance of each pond with cut and fill, and the acreages on Simplot (private) and BLM (federal) lands. **Figure 3-3** illustrates disturbance areas, buffers, and acreage estimates.

Table 3-1. Cooling Ponds Disturbance Area

Land Ownership	Pond 1	Pond 2	Total
	(acres)		
Simplot (Private Land)			
Pond w/cut and fill	18.8	15.2	34.0
Access, utilities, and buffers	23.4		23.4
Simplot total			57.4
BLM (Public Land)			
Pond w/cut and fill	34.5	29.1	63.6
Access, utilities, and buffers	24.9		24.9
BLM Land total			88.5
Grand Total			**145.9**

In order to construct these ponds in this location, Simplot would require approximately 88.5 acres of BLM land. This acreage includes access roads, underground utility corridor (water piping), and a 200-foot buffer around each pond. A conceptual level grading plan of the cooling ponds is presented in Appendix A.

3.2 Expand Gypsum Stack to East, South, and West Canyon Areas

To meet future gypsum storage needs, Simplot proposes acquiring (sale, exchange or lease) public land located east, south, and west of its Don Plant. **Figure 3-1** and **Figure 3-3** illustrate the current Don Plant gypsum stack system and the proposed lateral gypsum stack expansions areas onto adjacent BLM land. As illustrated, the build out includes expanding to the east canyon area (near the proposed cooling ponds), south canyon area to two small canyon areas south of the current gypsum stack area and then a large canyon area to the southwest (called west expansion herein). **Table 3-2** summarizes acreages of disturbances and includes buffers around the area (buffers allow room for pipelines, access roads, and native vegetation strip between stack and federal land). **Figure 3-3** illustrates the expansion areas and associated disturbance acreages.

Table 3-2. Gypsum Stack Disturbance Area

Land Ownership	Disturbance Area (acres)
Simplot (Private Land)	
See **Figure 3-3** for acreages on private associated with gypsum stack expansion.	
BLM (Public Land)	
West Canyon stack area Buffers Total	74.6 48.4 123
Main Stack (south) stack area Buffers Total	10.5 16.0 26.3
East Canyon stack area Buffers Total	24.0 15.0 39.0
BLM Land Total	**188.5**

Design concepts for the gypsum stack expansion (proposed action) are described in Appendix B.

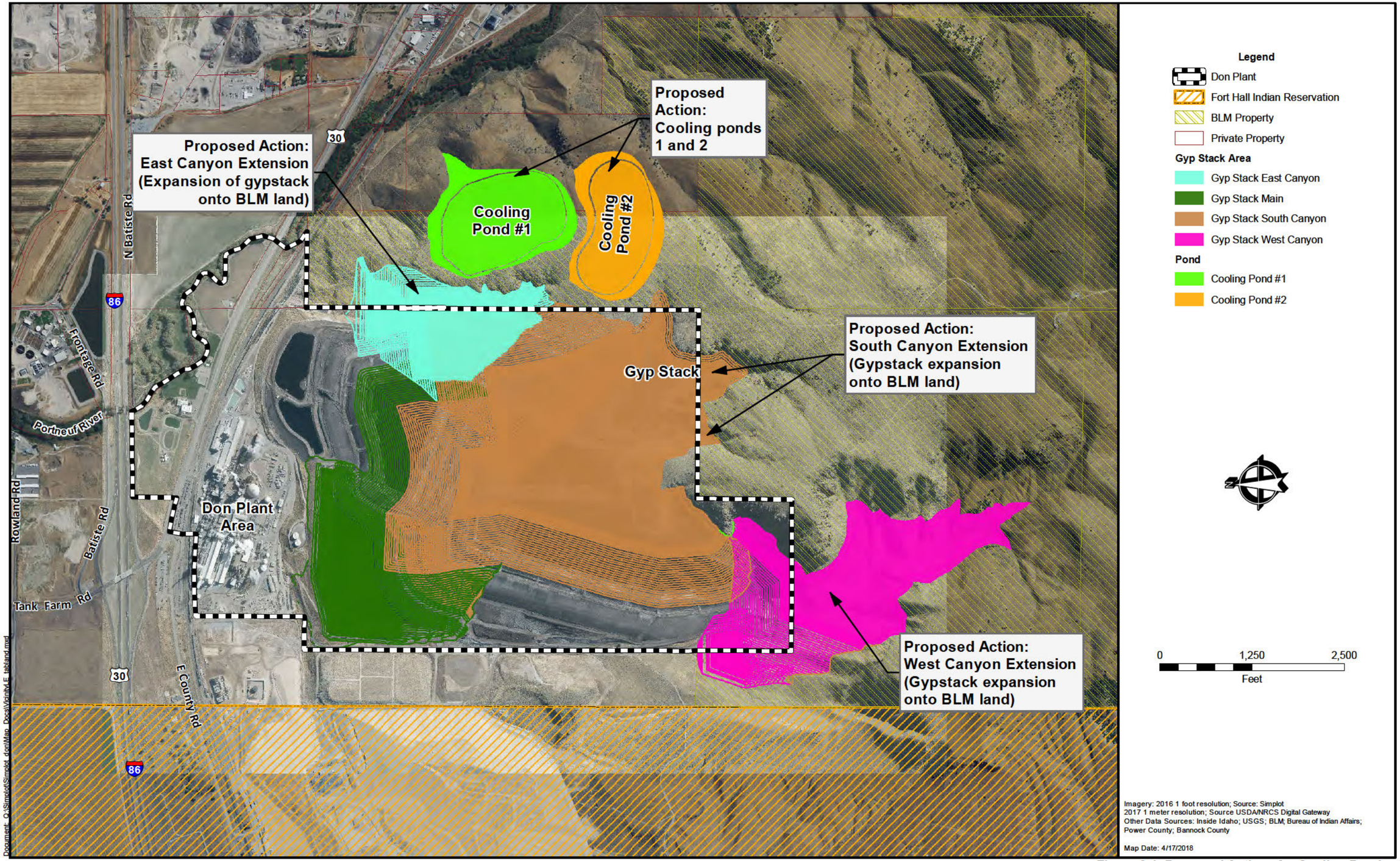
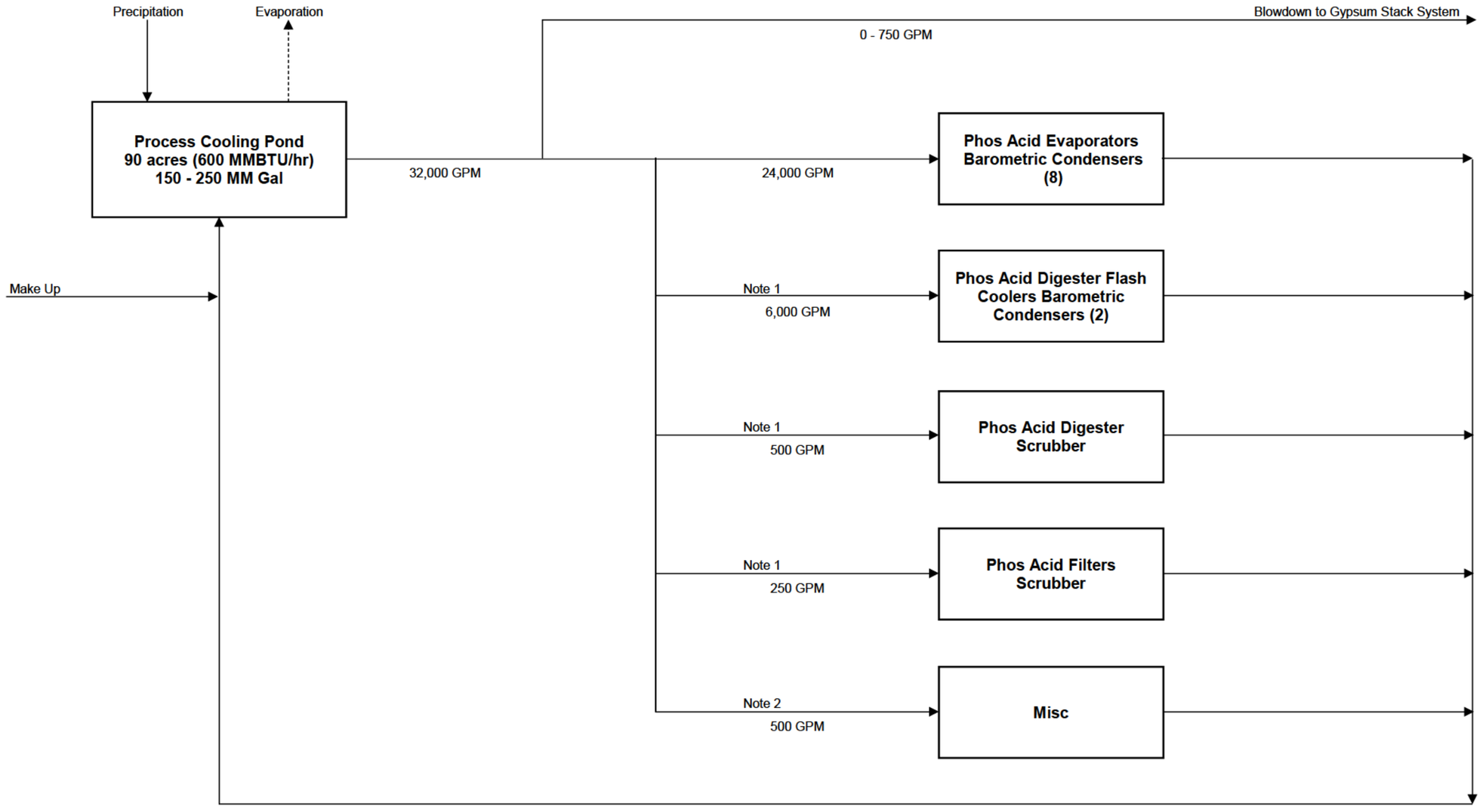


Figure 3-1. Proposed Actions for Cooling Ponds and Gypstack Expansion
Feasibility Study
Simplot Don Plant, Pocatello ID



Notes:

1. Currently part of Gypsum Stack System; heat load may be relocated to Cooling Pond depending on Process requirements

2. Miscellaneous minor streams (vacuum pump seal water, pump seal water, etc…)

Simplot

AGRIBUSINESS GROUP POCATELLO, ID

REFERENCES NO.	DESCRIPTION	REVISIONS NO.	BY	DATE	DESCRIPTION	NO.	BY	DATE	DESCRIPTION

RESP	DATE
DRAWN BY:	
DESIGNED BY:	
CHECKED BY:	
APPROVED BY:	

Phosphoric Acid Plant

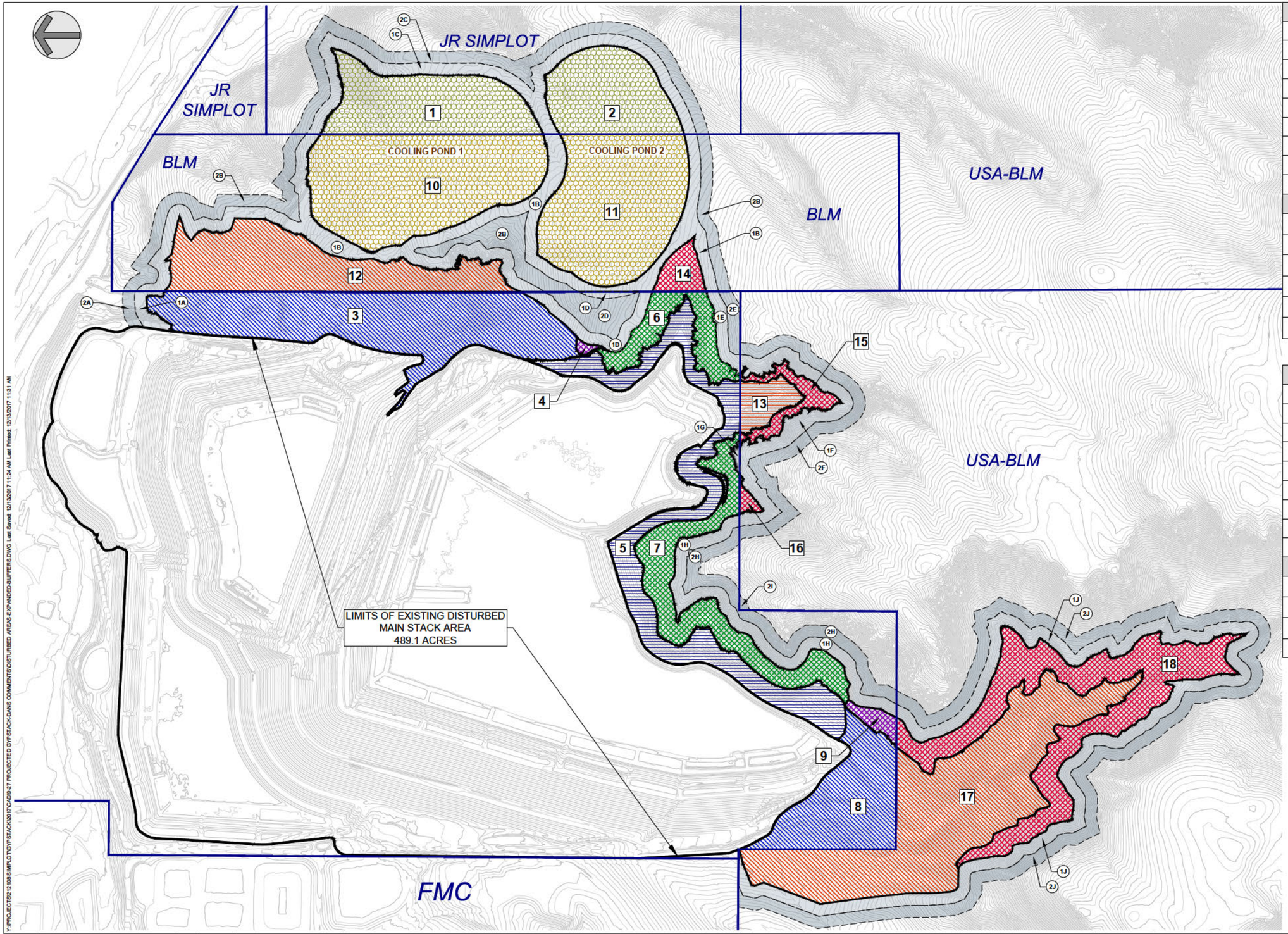
Process Cooling Pond System (Proposed)

Block Flow Diagram

Figure 3-2

SCALE: None

Revision



JR SIMPLOT PROPERTY		
1	COOLING POND 1	18.8 AC.
2	COOLING POND 2	15.2 AC.
3	EAST CANYON - UP TO 5005 EL.	35.9 AC.
4	EAST CANYON - 5005 EL. TO 5105 EL.	0.4 AC.
5	MAIN STACK - UP TO 5105 EL. (A)	26.3 AC.
6	MAIN STACK - 5005 EL. TO 5105 EL. (A)	7.4 AC.
7	MAIN STACK - 5005 EL. TO 5105 EL. (B)	16.7 AC.
8	WEST CANYON - UP TO 5005 EL.	17.0 AC.
9	WEST CANYON - 5005 EL. TO 5105 EL.	1.5 AC.

100 FT BUFFER		200 FT BUFFER	
1A	1.2 AC.	2A	3.1 AC.
1C	11.9 AC.	2C	23.4 AC.
1D	3.7 AC.	2D	7.5 AC.
1E	1.7 AC.	2E	3.0 AC.
1G	0.2 AC.	2G	–
1H	8.4 AC.	2H	15.5 AC.

BUREAU OF LAND MANAGEMENT		
10	COOLING POND 1	34.5 AC.
11	COOLING POND 2	29.1 AC.
12	EAST CANYON - UP TO 5005 EL.	24.0 AC.
13	MAIN STACK - UP TO 5005 EL.	3.7 AC.
14	MAIN STACK - 5005 EL. TO 5105 EL. (A)	2.8 AC.
15	MAIN STACK - 5005 EL. TO 5105 EL. (B)	3.4 AC.
16	MAIN STACK - 5005 EL. TO 5105 EL. (C)	0.6 AC.
17	WEST CANYON - UP TO 5005 EL.	45.3 AC.
18	WEST CANYON - 5005 EL. TO 5105 EL.	29.3 AC.

100 FT BUFFER		200 FT BUFFER	
1B	25.2 AC.	2B	39.9 AC.
1F	8.0 AC.	2F	15.8 AC.
1I	–	2I	0.2 AC.
1J	24.3 AC.	2J	48.4 A.C

Y:\PROJECTS\212108\SIMPLOT\GYPSTACK\2017\CAD\fig27 PROJECTED GYPSTACK-DANS COMMENTS\DISTURBED AREAS-EXPANDED-BUFFERS.DWG Last Saved: 12/13/2017 11:24 AM Last Plotted: 12/13/2017 11:31 AM

NO.	REVISIONS	BY	DATE

DRAWN: CKL | CHECKED: SJL
DESIGNED: — | APPROVED: SJL
CAD NAME: | SCALE: (Based on 11"x17" sheet) NOT TO SCALE

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Simplot
AGRIBUSINESS GROUP POCATELLO, IDAHO

Figure 3-3 Disturbance Area

DISTURBED AREAS-100 FT & 200 FT BUFFER

PROJECT NO. 212108

SHEET NO. 1

4 Alternatives

Simplot considered both on-site and off-site locations for the cooling ponds and for the gypsum stack expansion. This section summarizes alternatives considered and the rationale for selecting the proposed actions presented in Section 3.

4.1 Proposed Fluoride Reduction Alternatives

The IDEQ CO requires Simplot to reduce fluoride emissions from the Don Plant by one of the following approaches:

- Replace the existing reclaim cooling towers with a low emission alternative; or
- Incorporate measures that reduce fluoride emissions by more than 50 percent from the reclaim cooling towers to demonstrate compliance with the fluoride in forage standards.

4.1.1 No Action Alternative

Under a no action alternative, the cooling ponds would not be constructed and the cooling towers would remain. Simplot would not meet CO requirements (Case No. E-2012-.0022) and fluoride emissions would not be reduced.

4.1.2 Cooling Ponds

Use of lined cooling ponds would be a low-emission alternative to the cooling towers. Studies have found that if adequate land is available, ponds could be built with sufficient surface area to meet cooling requirements and allow for decommissioning of the cooling towers.

4.1.3 Indirect Process Water Cooling

This process involves converting the existing direct contact process water cooling towers to non-contact or fresh water cooling towers. Conversion to indirect cooling would involve installing heat exchangers to transfer heat load between the recirculated process cooling water stream and non-contact cooling water that would be recirculated through the cooling towers. With indirect cooling, water vapor is evaporated from the non-contact fresh water that is recirculated through the cooling towers, and not from the contact process water. Due to the scaling tendencies of the various fluoride compounds, a portion of the condensed vapors from the flash coolers and evaporator condensing system would need to be blown down to the gypsum slurry system. Studies have shown that scaling tendencies and water balance implications make this alternative infeasible.

Simplot is currently investigating hybrid options somewhere between full indirect process water cooling and cooling ponds. This investigation is on-going.

4.1.4 Fluoride Process Condensate (FPC)

This process removes some of the fluoride from the process water circuit before it reports to the cooling towers. The FPC recovery system would consist of a fluoride recovery tower installed between the evaporator and barometric condenser, an FPC recirculation tank and pump, and a series of duct sprays. Preliminary studies show that the overall process is prohibitively expensive and a cooling pond would still be required.

Evaluation of these alternatives indicate that cooling ponds are the most efficient and economically feasible technology that would meet CO requirements. Under the proposed action, all cooling towers would be taken off line and replaced by cooling ponds.

4.2 Cooling Pond Site Locations

Simplot conducted a series of studies to assess pond size requirements that would allow for the full replacement of the cooling towers (Simplot 2018). The total required surface area for process water-cooling by ponds is approximately 70 to 90 acres, depending on design options, including using current gypsum stack ponds for cooling, blending tanks, and other related technologies. For planning purposes, 90 acres of surface area is assumed plus additional acreage for buffers around the ponds, access roads, and related infrastructure. The studies also included hydraulic calculations, pipeline sizing, and identified equipment necessary to transport process-cooling water from the phosphoric acid plant to each the new pond(s) and then pump the cooled water back to the process (closed loop system).

Simplot identified sites at or near the Don Plant with sufficient acreage to accommodate cooling pond(s). The sites included properties owned by Simplot, as well as sites owned by other private entities and BLM land. Site alternatives evaluated are illustrated in **Figure 4-1** and are identified as follows:

1 FMC – On top of capped pond areas
2 FMC – Previous FMC plant site
3 Simplot - Swanson Ranch east of plant
4 Private – Five parcels: 4A, 4B1, 4B2, 4C, 4D
5 BLM/Simplot - Canyon east of existing gypsum stack
6 Simplot – BAPCO farmland
7 Simplot - Gypsum stack
8 Simplot – Spanbauer farmland
9 Simplot - Overflow Pond area
10 Private - Rowland Property

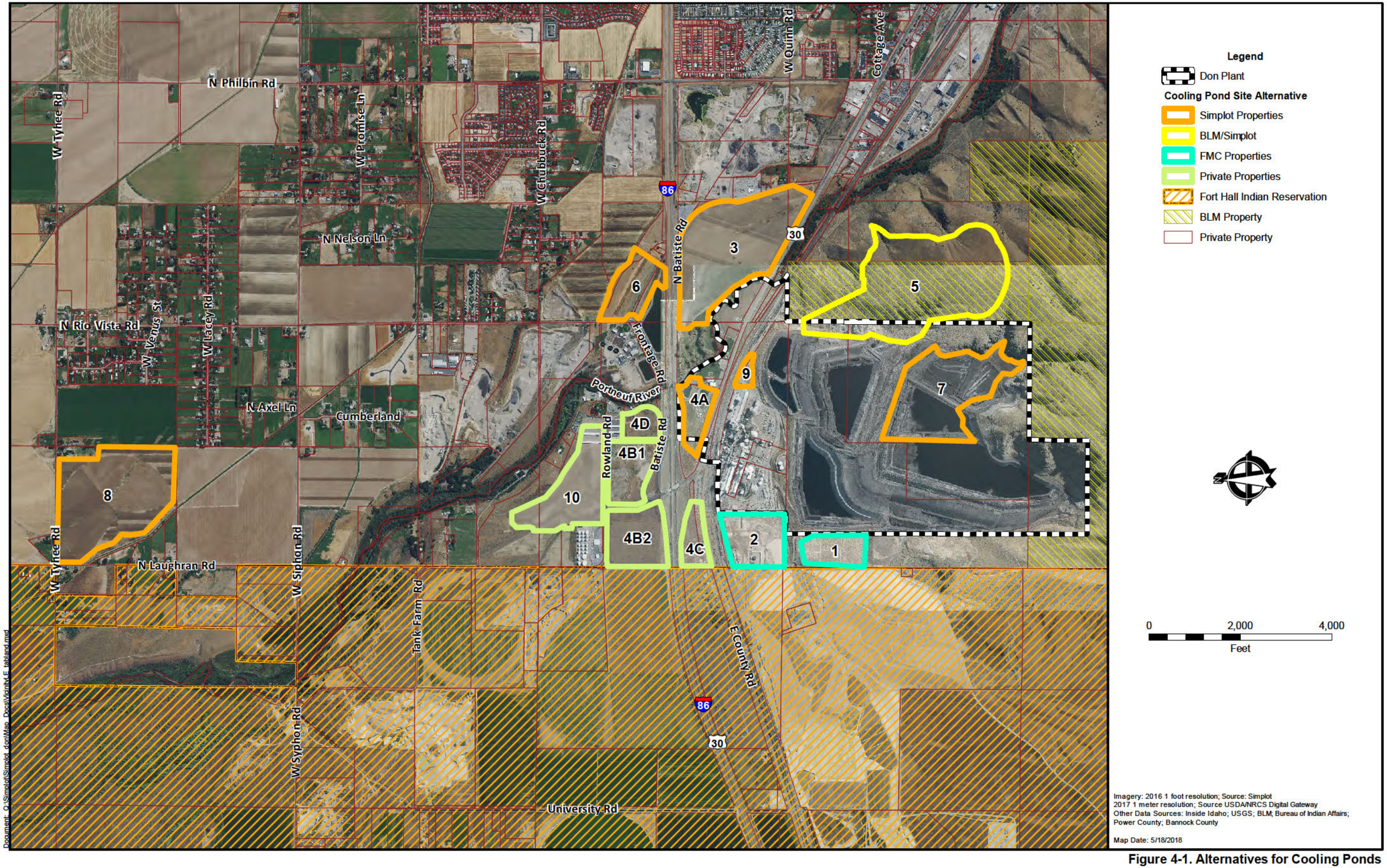


Figure 4-1. Alternatives for Cooling Ponds
Feasibility Study
Simplot Don Plant, Pocatello ID

Simplot used the following siting criteria to screen these 10 sites. A summary of site screening for each site is presented in **Table 4-1.**

- Acreage – The minimum requirement is 90 acres for pond(s) plus a buffer area between pond edge and the adjacent property. The rationale for the buffer (setback from property edge) is for fluoride deposition and safety (fog and ice on nearby public roads) (see sections 4.2.1 and 4.2.2 for further discussion). Quantitation for each alternative is acres.
- Constructability – Simplot evaluated depth to bedrock, depth to groundwater, and property topography (percent slope) as potential construction limitations. Constructability for each alternative was based on Natural Resource Conservation (NRCS) mapping for soil types and were classified as follows:

  Depth to bedrock limitation:

  - 0 to 6 feet – **high** – requires possible blasting and bedrock removal, or result in building large portion of pond above ground at higher costs
  - 6 to 10 feet – **moderate** – may require bedrock removal in some locations
  - More than 10 feet – **low** – assumes pond build with no bedrock removal

  Depth to groundwater limitation:

  - 0 to 6 feet – **high** – limits pond depth (desire to have liner minimum of 2 feet above high water table) and could require subsurface drain system
  - 6 to 10 feet – **moderate** – may require subsurface drain system or similar design
  - More than 10 feet – **low** – no limitation on pond liner design

  Slope limitation:

  - 8 percent or greater – **high** – larger cut/fill area, additional slope stability design requirements and costs
  - 4 to 8 percent – **moderate** – cut/fill requirements, additional design and costs (compared to flat areas but not as great a “high” category)
  - 0 to 4 percent – **low** – minimal limitation on pond design
- Distance from processing plant – Cooling water is circulated and must be pumped (or gravity flowed, if feasible) via piping to ponds and then pumped from ponds back to plant site. Thus, the greater the pond distance from the Don Plant, the greater the buried pipe length, pipe and pump size, and overall costs. Quantitation for each alternative is distance from pond to the phosphoric acid plant.
- Distance from residences – Cooling ponds are not compatible with residential areas due to steam (fog), fluoride emissions, and nuisances (e.g., noise from pumps and potential odors). In addition, the general area has zoning restrictions for industrial land uses versus residential uses that may limit site locations near residential developments. Quantitation for each alternative is the distance between the pond and nearest residential home (including trailer and RV parks).

- Public health/safety – Ponds could create fog and freezing ground conditions resulting in potential safety concerns for nearby public roads. See Section 4.2.1 for information on fog and ice assessment. Quantitation for each alternative is distance between the pond and nearest public road.
- Fluoride emissions - Ponds would have fluoride emissions but at levels lower than the cooling towers. In addition, fluoride dispersion and deposition would occur near the ponds. A buffer around the ponds is necessary and is desirable to be the same property ownership as the pond. Quantitation for each alternative is distance between pond and property boundary.

Table 4-1. Screening of Potential Cooling Pond Sites

Site	Location	Acres	Construction Limitations			Distances (feet) from Pond(s)[1]				Assessment
			Bedrock	GW[2]	Slope	Processing Plant	Residences	Public Road	Property Boundary	
1	FMC –On top of existing capped pond areas	23	Mod	Mod	High	2,900	5,500	1,825	75 (Fort Hall)	Only provides portion of land area required and would be combined with Site 2. Close proximity to Don Plant and relatively level; away from public roads, site used by FMC for ponds (now closed); land owned by FMC and adjacent to Fort Hall; questionable feasibly of placing on top of former FMC ponds; unknown environmental conditions and potential issues with FMC Superfund (EMF) closure.
2	FMC –Previous plant site	35	Low	Mod	Low	2,400	3,800	180	75 (Fort Hall)	Only provides portion of land area required and would be combined with Site 1. Close proximity to Don Plant and relatively level; close to public roads (fog and ice concern), owned by FMC and adjacent to Fort Hall; unknown environmental conditions and potential issues with FMC Superfund (EMF) closure.
3	Simplot – Swanson Ranch	98	Low	Mod	Low	3,600	500	300	100	Site currently used by Simplot for process water land application (permitted by IDEQ). Close proximity to residences, public roads, and property boundaries resulting in fog and ice, odor, and fluoride deposition concerns.
4	Private, parcels: 4A, 4B1, 4B2, 4C, 4D	99	Low	Mod	Low	2,700	600	75	25	Multiple private sites could involve up to 5 ponds. Close proximity to residences, public roads, and property boundaries resulting in fog and ice, odor, and fluoride deposition concerns. Land owned by others (private).
5	BLM/Simplot – Canyon east of existing gypsum stack	200	Mod	Low	High	3,100	3,800	2,200	1,100	Adjacent to gypsum stack and represents area that has greatest distance from residences, public roads and property boundaries; so provides the greater public safety and less impacts to off-site properties for fluoride emissions. In steep terrain, more difficult and costly to build compared to sites in valley. Land ownership currently Simplot and federal (BLM). This is the proposed action site presented in Section 3.
6	Simplot – BAPCO farmland	65	Low	Low	Mod	3,500	1,500	325	25	Acreage is limiting for pond and buffers. Site currently used by Simplot for process water land application (permitted by IDEQ). Close proximity to residences, public roads, and property boundaries resulting in fog and ice, odor, and fluoride deposition concerns. Land owned by Simplot.
7	Simplot - gypsum stack	100	Low	Low	Low	1,700	5,200	2,100	2,000	Would require lined pond on top of gypsum stack operations and would result in reduction in gypsum stack storage area and reduce life of Don Plant. Land owned by Simplot.
8	Simplot – Spanbauer farmland	95	Low	Low	Low	12,000	425	25	50	Greatest distance from Don Plant of sites evaluated, thus costs of piping and pumping would be higher than others. Site currently used by Simplot for process water land application (permitted by IDEQ). Close proximity to residences, public roads, and property boundaries resulting in fog and ice, odor, and fluoride deposition concerns. Land owned by Simplot.
9	Simplot Overflow pond area	25	Low	Mod	Low	650	4,100	350	300	At Don Plant and would represent shortest distance for pumping but there is not sufficient area available given the current pond configurations and the addition of the two new decant ponds. Also, closer to public roads and property boundaries compared to Site 5.
10	Rowland Property	54	Low	Mod	Low	3,400	450	50	50	Relatively close to site but close proximity to residences, public roads, and property boundaries resulting in fog and ice, odor, and fluoride deposition concerns. Land owned by others (private).

[1]See Section 4.2 for description of limitations.
[2]GW = groundwater.

4.2.1 Fog and Ice Assessment

Cooling ponds can create fog, and during winter months, this fog can create icy conditions on nearby surfaces. Thus, placing ponds too close to public roadways can create unsafe driving conditions and reduce driver visibility. As presented in **Table 4-1** and illustrated in **Figure 4-1**, several sites are in close proximity of public roads (Idaho State Highway 30 [Hwy 30] and Interstate 86 [I-86]).

To understand potential fogging and icing conditions associated with cooling ponds, Simplot contracted with Ramboll Environ US Corporation to conduct a screening level analysis for fog and ice formation for two locations (Environ 2018):

- A pond located in the Portneuf River valley that corresponds to site 4A (**Figure 4-1**). This site is representative of the pond sites at lower elevation in the valley area that are near public roadways (sites 2, 3, 4, 6, 8, 9, and 10 listed in **Table 4-1**).
- Site 5, the proposed action that has two ponds constructed at higher elevation and east of the gypsum stack.

Environ used the air dispersion model (AERMOD) to estimate airborne water concentrations and predict fog formation on a grid network around the pond. They ran the model on an hourly basis over a 1-year period using area-specific meteorological conditions. Findings of the study include the following (Environ 2018):

- The frequency of fog formation would be about the same for both sites given that pond surface area and water temperatures are similar.
- The key safety factor is fog formation on public roadways, which is a function of distance of ponds to public roads.
- Environ predicted the frequency for fog to migrate to Hwy 30 and I-86:
    - Site 4A (in valley area): 800 hours of fog per year on parts of Hwy 30 and 200 hours of fog per year on I-86. For Hwy 30, 200 hours of the total 800 hours of fogging conditions would be when temperatures are below freezing; thus, potential for icing conditions on the roadway.
    - Site 5 (east canyon ponds): 20 hours of fog per year on parts of Hwy 30 and 10 hours of fog per year on I-86. For Hwy 30, approximately 5 hours out of 20 hours of fogging would occur when temperatures are below freezing (icing conditions).
- In summary, fog formation over public roads for Site 4A, and other sites near public roads (sites 2, 3, 4, 6, 8, 9, and 10 listed in **Table 4-1**), would result in fog formation frequency of up to 40 times greater compared to the proposed east canyon ponds.

4.2.2 Fluoride Emissions

Simplot's objective in removing the cooling towers in favor of cooling ponds is to reduce fluoride emissions to the atmosphere and associated deposition on downwind (off-site) areas. Cooling ponds would also result in fluoride emissions, but dispersion and deposition is localized compared to cooling towers.

Table 4-2 summarizes fluoride emissions from the cooling towers from 2013 through 2017 and compares this to estimated emissions for a 90-acre cooling pond. In summary, the cooling ponds results in approximately 1/3 of the cooling towers emissions.

Table 4-2. Fluoride Emissions for Cooling Towers between 2013 and 2017 compared to Estimate Emissions from Cooling Pond.

Year	Fluoride Emission Cooling Towers (Tons/year)
2013	103.13
2014	87.58
2015	77.76
2016	67.29
2017	61.08
Estimated Fluoride Emissions from Cooling Pond	26.3

4.2.3 Conclusions for Cooling Pond Site

Table 4-1 summarizes 10 potential areas for the cooling ponds. Sites (2, 3, 4, 6, 8, 9, and 10) are located in the Portneuf Valley area (lower elevations), and/or across I-86, and are in close proximity to residences, public roads, and/or property boundaries resulting in fog and ice, odor, and fluoride deposition concerns. As illustrated from the modeling discussed in sections 4.2.1 and 4.2.2, these sites present greater safety risks for fog and icing on nearby public roads, and also present fluoride emission concerns because of proximity to receptors. Site 5 (east canyon area) is further away from public roads, residences, and property boundaries compared to the other sites (except for Site 7, gypsum stack, which is not a feasible location because it would result in reducing the life of gypsum stack operations). Thus, Site 5 provides for greater public safety compared to the other sites. Furthermore, this site is within the EMF area of influence in that it currently has elevated levels of fluorides in soils and vegetation. Adding cooling ponds to this area would continue to limit fluoride emissions to an already impacted area. Site 5 (east canyon area) is the recommended proposed action.

4.3 Gypsum Stack

In addition to the proposed action described in Section 3.2 of expanding the gypsum stack to the east, south, and west canyon areas, Simplot considered other reasonable alternatives for gypsum stack expansion, including other lands in the area that could serve for disposal of the gypsum by-product as well as assessing the ability to continue to build up on the existing gypsum stack. Regarding the latter, Simplot has maximized gypsum stack storage on the current Don Plant site through implementing the gypsum stack expansion project (phases 1 to 6) described in Section 2.3.1. The only reasonable alternative is to expand off site. In addition to the east, south, and west canyon areas (described as proposed actions in Section 3), Simplot has evaluated the adjacent FMC property.

4.3.1 No Action Alternative

In order to ensure uninterrupted operation of the facility at current production rates, Simplot must expand by adding land to receive gypsum. Under the no action alternative, no additional land would be obtained. Failure to obtain additional land for a suitable storage site would mean Simplot would have to reduce production rates or even cease production altogether at the Don Plant. A shutdown would be hugely detrimental to the region's economy. The economic impacts of ore processing and mining include the following:

- For southern Idaho, mining employees 6,900 persons and generates approximately $79 million dollars in tax revenue (Peterson 2015).
- Mine-related processing (such as the Don Plant) generates about 5,000 jobs in Idaho and results in approximately $55 million in tax revenue (Peterson 2015).
- For 2016, the Don Plant directly employed over 600 persons at Smoky Canyon Mine and the Conda Pump station. Additionally, contractors, venders, and other businesses rely on Simplot operations for revenue.

4.3.2 Adjacent FMC Property

Simplot evaluated an alternative that would acquire portions of the adjacent FMC property for gypsum by-product disposal. Most of the FMC property is contained within the Fort Hall Indian Reservation; therefore, purchasing land in this area would require authorization from the Shoshone Bannock Tribes. This area is also included in the Eastern Michaud Flats Superfund site within the FMC operational area. Proposing to permanently dispose of phosphogypsum in this area under the current regulatory closure scenario and land ownership challenges is not a reasonably feasible scenario.

4.3.3 Vertical Expansion of Existing Main Gypsum Stack

In this scenario, gypsum would continue to grow vertically, stepping up at a 3:1 slope on the east, west, and north faces (as required) with the goal of keeping the stack on Simplot property. Vertical growth is restricted by the slope stability of the main stack system, which includes adequate factors of safety. The gypsum stack engineer of record (Ardaman & Associates, Inc.) has stated that the main stack can be raised to 5,100 feet elevation and still maintain slope stability with an adequate factor of safety (this is based on experience with the Don Plant stack system). An updated detailed stability analysis is being conducted to verify this assumption.

Assuming stability calculations deemed the stack system stable enough to support continued growth above 5,100 feet, operations of the system become extremely challenging as the stack is vertically raised. Raising the stack sloping inward on all sides results in a diminishing top (main compartment) area, which drives the water levels up at an increasing rate. This results in the need to raise perimeter dikes at increased rates to keep above the rising water levels, and thus drives the stack to the end of its life faster. Reduced ponded acres makes it more difficult to build utilizing rim ditching alone, as the cells used for build/borrow material do not have sufficient time to dry before another dike raise is required. This requires supplementing dike build with gypsum material mined and hauled from an onsite borrow, the source of which is very limited with a nearly fully lined facility. Another issue with continued growth above 5,100 feet is pumping and distributing slurry to that height. Current pump systems (East and West Booster

Stations) are capable of lifting slurry to 5,000 feet, and with modification can raise to 5,100 feet. To go higher than that, additional pump stations will need to be constructed, further complicating operations from not only a production standpoint but also from and environmental and safety risk perspective. For these reason, raising the stacks above the 5,100 foot elevation within the Simplot property is not feasible for long-term operations.

4.3.4 South, East, and West Canyon Areas

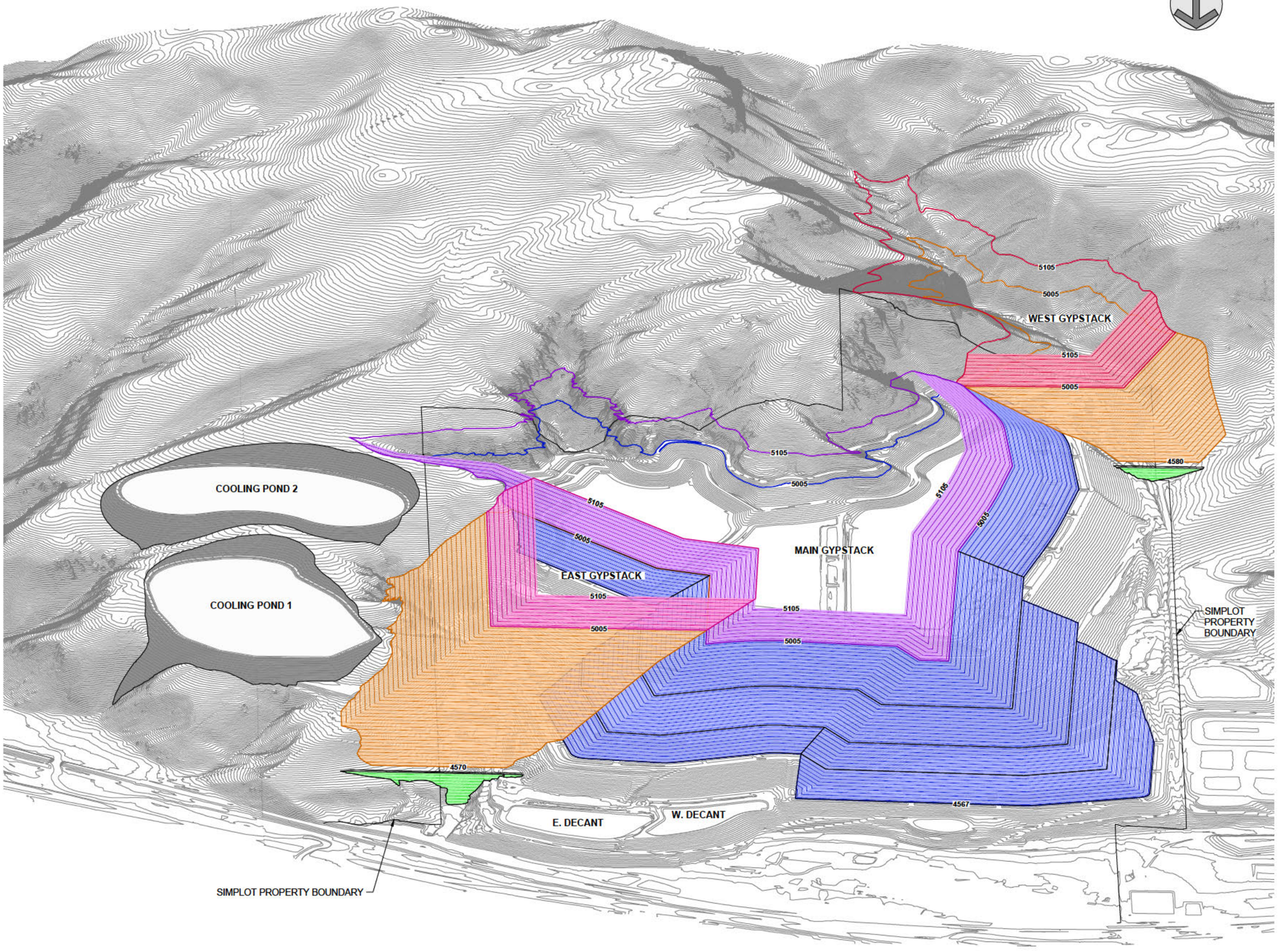
As described in Section 3, the proposed action is to expand the gypsum stack to adjacent lands (portions of which include BLM land). This allows for the integration of the existing gypsum stack system, allowing for optimization of storage, water management, and the sharing of existing lined infrastructure (e.g. lined decant ponds would remain in place).

4.3.5 Off-site Expansion Requirements

Since 2011, Simplot has expanded its gypsum operations and added lined compartments for receiving gypsum, leachate collection systems, and lined decant ponds. This design, construction, and operational experience has provided Simplot important information and experience useful for expanding the gypsum stack operations onto off-site land such as the proposed south and east canyon areas, including: (1) the amount of waste that would be stored in the canyon south of the Don Plant; (2) preparation needed for waste storage; (3) the type of liner; (4) installation of the liner in the canyon terrain; and (5) information related to groundwater flows under the canyon.

Figure 4-2 illustrates the gypsum stack buildout and provides a volume estimate table. Preparation of the canyon is described in Appendix B. Also see Appendix B for liner type (60-mil HDPE) and an overall description of gypsum stack development and liner installation.

The gypsum stack would be lined and there would be a leachate collection system; therefore, the gypsum stack system would meet Idaho's Groundwater Quality Rules. The Don Plant groundwater system has been extensively studied and baseline data is available on groundwater quality.



VOLUME TABLE	
MAIN GYPSTACK - ELEVATIONS 4567 TO 5005	
2D AREA	16,596,527 SQ. FT.
CUT	78,000 CU. YDS.
FILL	59,264,471 CU. YDS.
NET <FILL>	59,186,471 CU. YDS.
MAIN GYPSTACK - ELEVATIONS 5005 TO 5105	
2D AREA	9,304,495 SQ. FT.
CUT	565 CU. YDS.
FILL	26,879,774 CU. YDS.
NET <FILL>	26,879,210 CU. YDS.
EAST CANYON - ELEVATIONS 4570 TO 5005	
2D AREA	4,972,553 SQ. FT.
CUT	81 CU. YDS.
FILL	26,311,224 CU. YDS.
NET <FILL>	26,311,143 CU. YDS.
EAST CANYON - ELEVATIONS 5005 TO 5105	
2D AREA	2,812,176 SQ. FT.
CUT	0 CU. YDS.
FILL	7,021,789 CU. YDS.
NET <FILL>	7,021,789 CU. YDS.
WEST CANYON - ELEVATIONS 4780 TO 5005	
2D AREA	2,839,558 SQ. FT.
CUT	1,556 CU. YDS.
FILL	8,411,244 CU. YDS.
NET <FILL>	8,409,688 CU. YDS.
WEST CANYON - ELEVATIONS 5005 TO 5105	
2D AREA	2,780,021 SQ. FT.
CUT	464 CU. YDS.
FILL	7,352,681 CU. YDS.
NET <FILL>	7,352,217 CU. YDS.

Y:\PROJECTS\212108\SIMPLOT\GYPSTACK\2017\CAD\6-27 PROJECTED GYPSTACK\DANS COMMENTS\PROJECTED ISOMETRIC-EXPANDED.DWG Last Saved: 10/3/2017 4:53 PM Last Plotted: 10/3/2017 4:54 PM

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CAD NAME: | SCALE: (Based on 11"x17" sheet) NOT TO SCALE

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Meridian, Idaho 83642
(208) 288-1992

Simplot
AGRIBUSINESS GROUP POCATELLO, IDAHO

Figure 4-2. Gypsum Stack Buildout

MAXIMIZED EAST CANYON - SOUTH VIEW

PROJECT NO. 212108

SHEET NO. 4

5 Summary and Recommendations

5.1 Cooling ponds

Site 5 (east canyon cooling ponds) is the preferred site for cooling ponds. Section 3.1 describes this site and its cooling pond implementation. Site 5 is further away from public roads, residences, and property boundaries compared to the other sites evaluated (except for Site 7 (gypsum stack) which is not a feasible location because it would result in reducing the life of gypsum stack operations), and as a result, provides for greater public safety (e.g., less fog and ice formation on public roads). The cooling ponds provides for reduced fluoride emissions compared to the cooling towers and adding cooling ponds to the Site 5 area would continue to limit fluoride emissions to an already impacted area for historic Don Plant and FMC activities. Based on this rationale, Site 5 (east canyon area) is the recommended proposed action.

5.2 Gypsum Stack

While Simplot evaluated the FMC/Fort Hall property area for potential future gypsum stack operations, and evaluated the feasibility of growing the stack vertically on private property, the evaluation results indicated that to be economically and operationally feasible, Simplot's storage area should be located as close as possible to their existing fertilizer processing plant, but off-site storage is needed. The east, west, and south canyon areas are adjacent to existing operations, which allows for the integration of the existing gypsum stack system, optimizing storage, water management, and sharing infrastructure (e.g., lined decant ponds would remain in place). For these reasons, expansion of the current permitted lined gypsum stack operations to the east, west, and south canyon areas is the recommended proposed action.

5.3 Summary of Land Expansion Needs

Figure 3-3 summarizes the overall BLM land disturbance footprint with buffers accounting for access, infrastructure and setbacks. **Table 3-1** and **Table 3-2** provide acreage estimates; overall, the BLM footprint is 277 acres. As illustrated in **Figure 3-3**, a portion of BLM north of the proposed cooling ponds becomes isolated (not accessible and surrounding by private land); therefore, it may be reasonable to include that land in a land sale, exchange, or lease.

6 Literature Citation

Ardaman & Associates, Inc. 2017. *General Design and Construction Techniques for Gypsum Stack Expansion*.

Environ [Ramboll Environ US Corporation]. 2018. *Cooling Pond Modeling Analysis. Simplot Don Plant*.

Idaho Department of Environmental Quality. 2016. Consent Order Case No. E-2012.0022 2013AAJ113 with the J.R. Simplot Company – Don Siding Plant. June 16, 2016.

Keller [Keller Associates]

2017a. Gyp Stack Growth Model, Task 1; Historic Growth Rate 2012-2016.

2017b. *Gyp Stack Growth Model, Task 2; Volume Life of Gyp Stack to Elevation 5005*.

2017c. *Gyp Stack Growth Model, Task 3; Initial Build Configuration of the East and West Canyons*.

Peterson, S. 2015. *Economic Impacts of Idaho Mining Associated Member Firms 2007-2014*. Sponsored by the Idaho Mining Association. December 10, 2015.

Simplot [J.R. Simplot Company]

2015. *Gypsum Stack Lining Project Lateral Expansion. Simplot Don Plant. Pocatello, Idaho*. March 2015.

2017. *Fluoride Emission Remedial Action Plan*. Don Plant Facility Case No. E-2012.0022. Revision 1. June 30, 2017.

2018. *Cooling Pond Conceptual Design. Simplot Don Plant. Pocatello, Idaho, February 2018*.

A

Cooling Ponds Concept Design

Cooling Pond Concept

Prepared by J.R. Simplot Company

May 10, 2018

Table of Contents

Figures

Attachments

1 Process Water Cooling Operations

1.1 Phosphoric Acid Production

Phosphate fertilizer is produced by first reacting phosphate ore with sulfuric acid. This exothermic reaction produces phosphoric acid in a concentration ranging from 26 to 32 percent, as well as a di-hydrate calcium sulfate solid (phosphogypsum). Elemental constituents (e.g., fluoride (F), calcium (Ca), aluminum (Al), iron (Fe), magnesium (Mg), and, silica (Si)) naturally present in the ore are found in the phosphoric acid and phosphogypsum in varying levels. The heat produced in the reaction is removed by flash cooling the phosphoric acid under a slight vacuum and by an air sweep over the reaction vessel. The vapors from the flash cooler are condensed in a direct contact heat exchanger (barometric condenser) and the vapors from the reaction vessel air sweep are partially condensed and cleaned of pollutants in a cross-flow scrubber.

The dilute phosphoric acid from the reaction system is subsequently concentrated through evaporation to achieve required concentrations for processing into various fertilizer or industrial products. The evaporation occurs under a slight vacuum in forced circulation evaporation units using steam. As water is removed from the phosphoric acid, more volatile components (mostly fluoride compounds) as well as small amounts of liquid entrainment are also present in the vapor. The vapor stream from the evaporators is condensed using direct contact heat exchangers (barometric condensers). The direct contact heat exchange requires large circulating flows and results in the cooling medium containing various compounds present in the phosphoric acid that either volatilize or carry over in liquid droplets with the water vapor to be condensed.

Most of the heat load from the phosphoric acid plant is removed using cooling towers, with a portion of the heat load removed using the phosphogypsum stack system. Emissions from cooling towers include both vapor and liquid (entrainment /drift losses).

1.1.1 Phosphogypsum

The phosphogypsum produced in the reaction system is removed from the phosphoric acid using filtration. The phosphogypsum filter cake is sluiced with water and pumped to the lined gypsum stack for storage. The stack allows for the phosphogypsum to settle out, and the transport water is captured and returned to the production plant for reuse.

1.1.2 General Water Balance

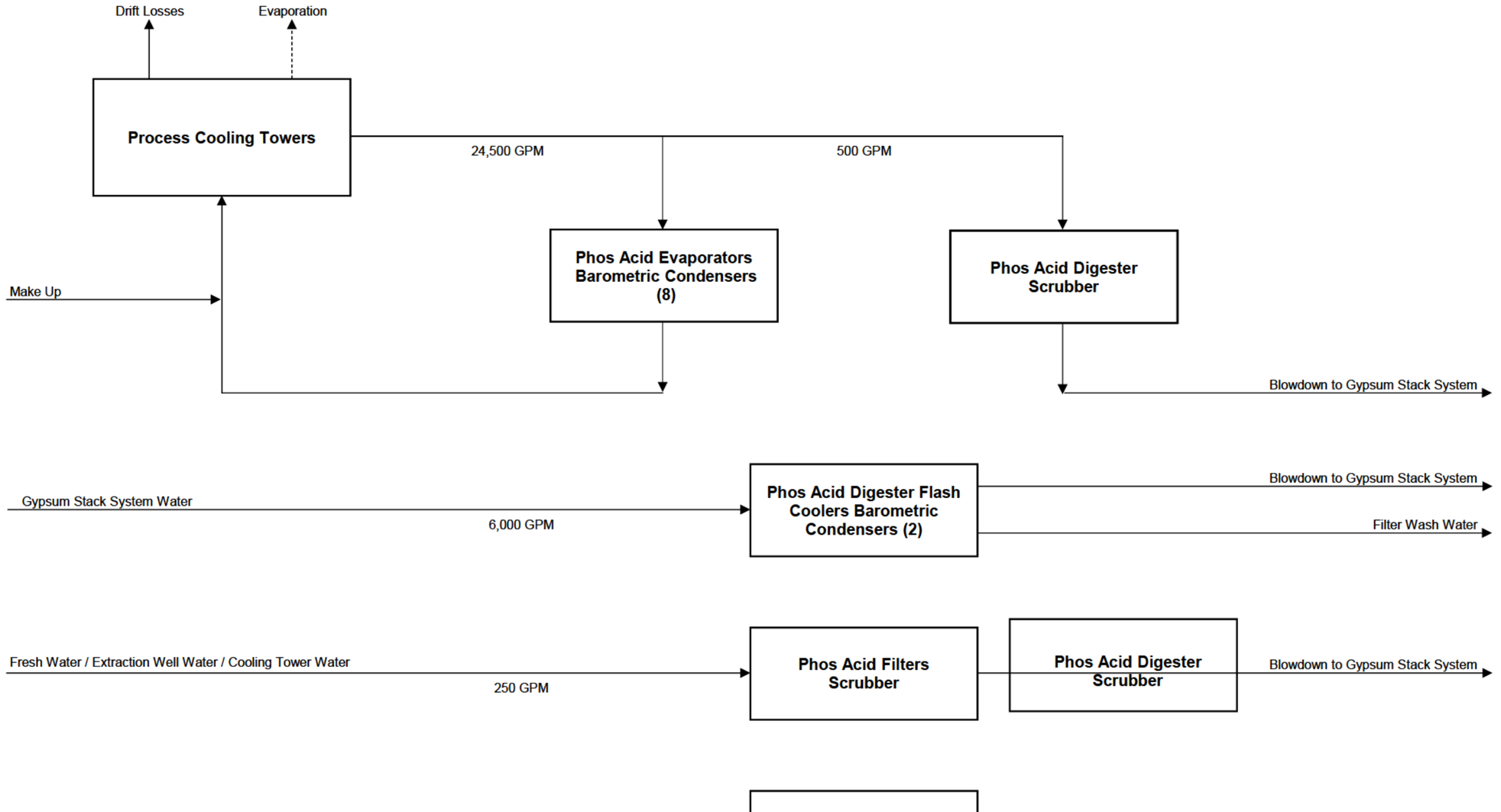
A general process flow diagram and water balance for current operations is presented in **Figure 1.** Water input into the system comes from fresh water (on-site wells), extraction well water, and from the slurried phosphate ore piped to the Don Plant from Simplot's Smoky Canyon Mine in southeast, Idaho.

2 Cooling Pond Concept

Simplot entered into a CO with IDEQ (Case No. E-2012.0022) requiring that Simplot reduce fluoride emissions from the Don Plant by either replacing the existing reclaim cooling towers with a low emission alternative or incorporating measures that provide for greater than 50 percent fluoride emissions reductions from the reclaim cooling towers with demonstration of compliance with the fluoride in forage standards. Simplot has conducted an assessment of alternatives and found that using lined cooling pond(s) to remove the heat load from the phosphoric acid plant is the preferred approach to meet the CO requirements. Simplot would transfer the process cooling water to cooling pond(s), where water would be cooled and then pumped back to the cooling system for reuse.

Simplot would construct at least two ponds (cooling ponds 1 and 2) to the east of the gypsum stack (Attachment A). The area required for the cooling ponds (disturbance area including cut and fill) is approximately 80 to 100 acres. The range in area is due to potential design options, including using current gypsum stack ponds for cooling, blending tanks, and other related technologies. For planning purposes, 100 acres of pond disturbance area is assumed plus additional acreage for buffers around the ponds, access roads, and related infrastructure.

Figure 2 presents a process flow diagram and water balance illustrating the conceptual cooling pond system. Ponds 1 and 2 would be located on both Simplot and BLM land as presented in Attachment A. Simplot evaluated other potential locations for the ponds and has determined that the proposed location (shown in Attachment A) is the most feasible (see Feasibility Study report, Simplot 2018).



Notes:

1. Miscellaneous minor streams (vacuum pump seal water, pump seal water, etc…)

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REFERENCES	NO.	DESCRIPTION

REVISIONS	NO.	BY	DATE	DESCRIPTION	NO.	BY	DATE	DESCRIPTION

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APPROVED BY:	

Phosphoric Acid Plant

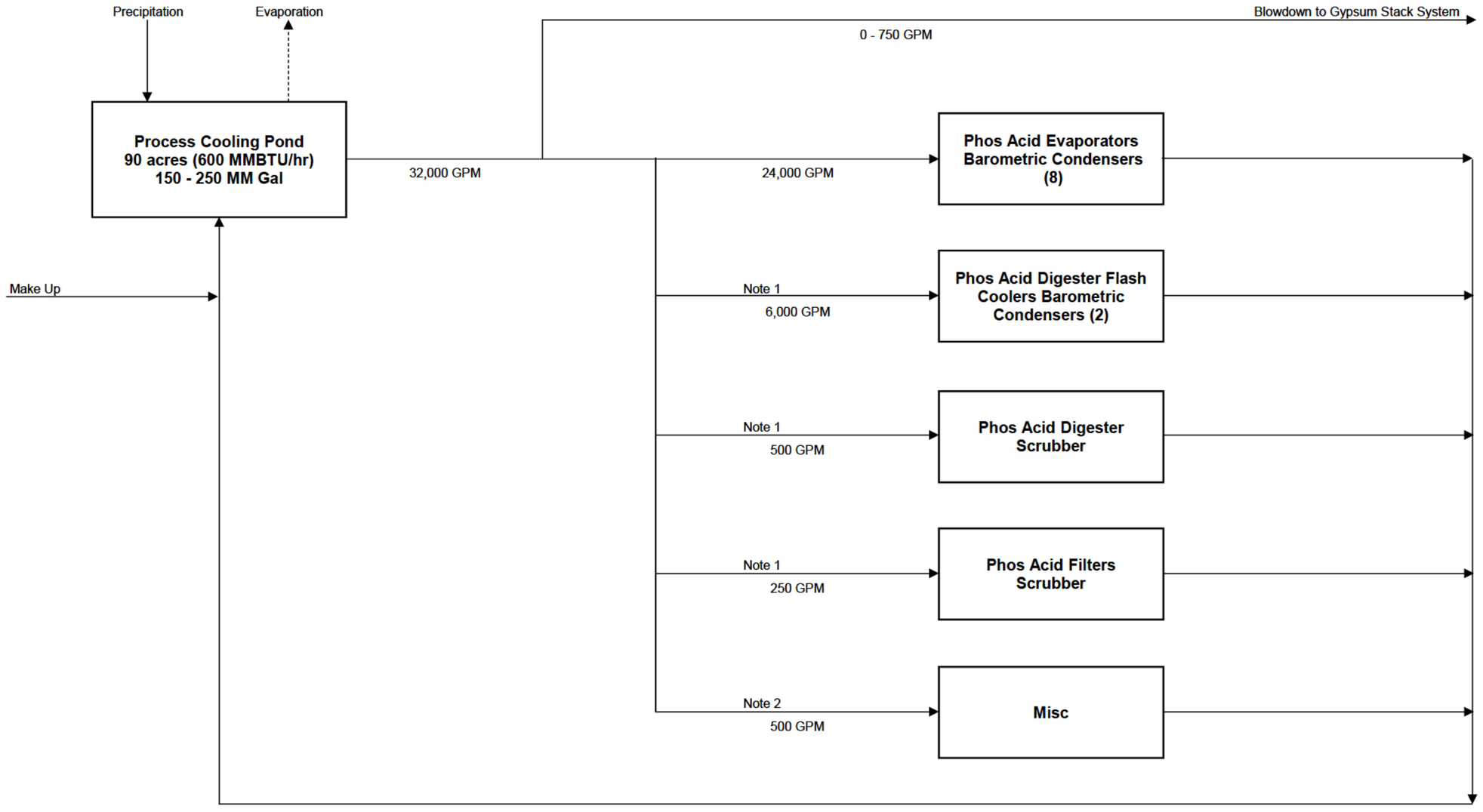
Process Cooling System (Existing)

Block Flow Diagram

Figure 1

SCALE: None

Revision



Notes:

1. Currently part of Gypsum Stack System; heat load may be relocated to Cooling Pond depending on Process requirements

2. Miscellaneous minor streams (vacuum pump seal water, pump seal water, etc…)

Simplot

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REFERENCES NO.	DESCRIPTION

REVISIONS NO.	BY	DATE	DESCRIPTION	NO.	BY	DATE	DESCRIPTION

RESP	DATE
DRAWN BY:	
DESIGNED BY:	
CHECKED BY:	
APPROVED BY:	

Phosphoric Acid Plant

Process Cooling Pond System (Proposed)

Block Flow Diagram

Figure 2

SCALE: None

Revision

ATTACHMENT A:
Conceptual Design

PHASE 1

BLM PROPERTY

SIMPLOT / BLM PROPERTY LINE

SIMPLOT / BLM PROPERTY LINE

COOLING POND 1

TOP OF POND

BOTTOM OF POND

SIMPLOT PROPERTY

SIMPLOT PROPERTY

PHASE 4

PHASE 5

COOLING POND 2

TOP OF POND

BOTTOM OF POND

4810
4820
4830
4840
4850
4860
4870
4880
4890
4900
4910
4920
4930
4940
4950
4960
4970
4980
4990
5000
5010
5020
5030
5040
5050
5060
5070
5080
5090
5100
5110
5120
5130

0 100' 200'

SPRING 2014 EXISTING GROUND SURFACE

Y:\PROJECTS\212108\SIMPLOT\GYPSTACK\2017\CAD\3-29 COOLING POND 2\2017 COOLING POND EXHIBITS UPDATE.DWG 3/30/2017

NO.	REVISIONS	BY	DATE

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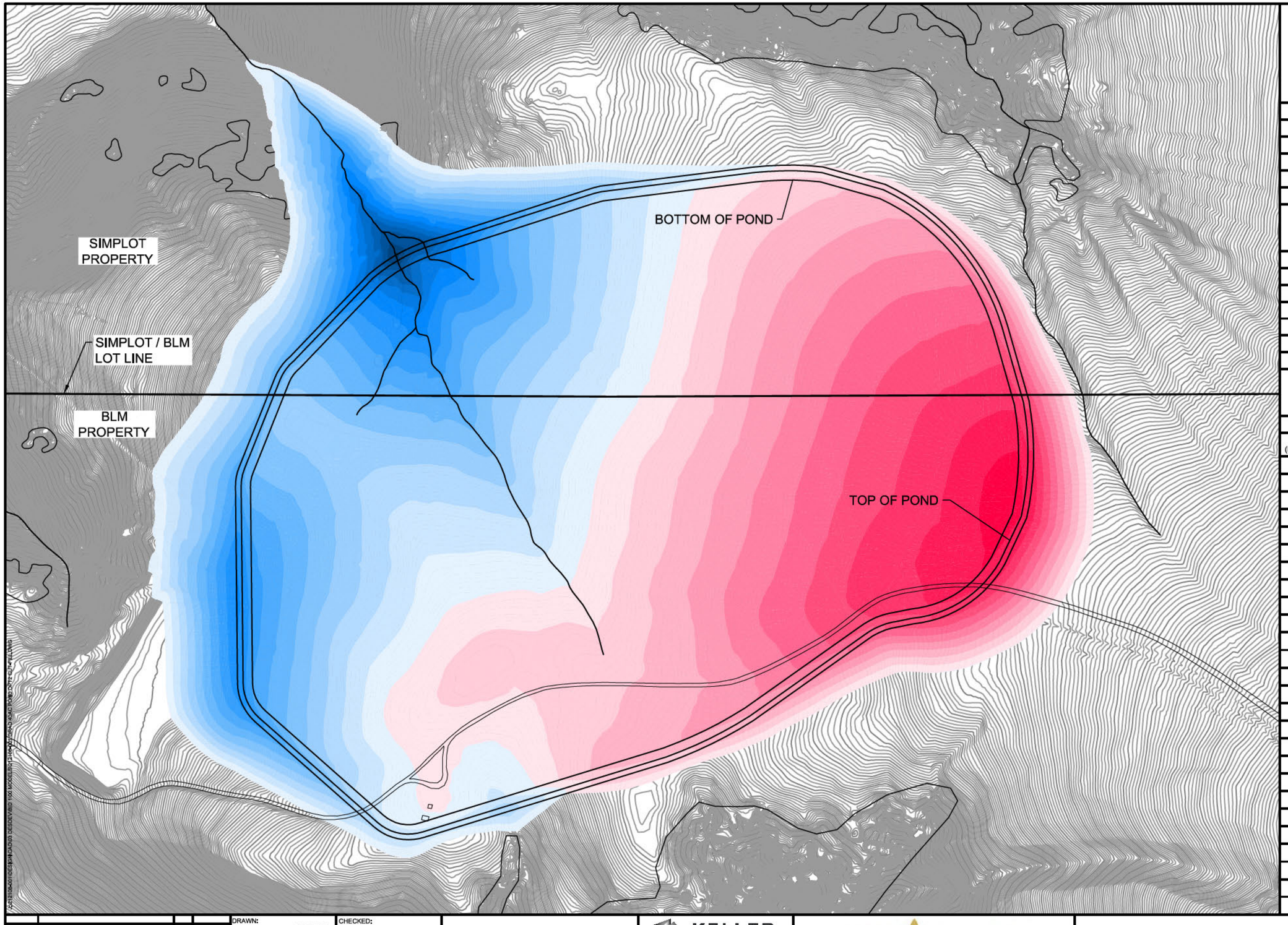
SIMPLOT COOLING PONDS

TOPOGRAPHY AND BOUNDARIES

PROJECT NO. 212108-001

SHEET NO. 1



0 100' 200'

COOLING POND	
SIZE	40 ACRES
TOP ELEVATION	4837.40 FT
BOTTOM ELEVATION	4827.40 FT
OUTSIDE SLOPE	1.5:1 SLOPE
INSIDE SLOPE	2:1 SLOPE

CUT - FILL SUMMARY	
2D AREA	2,320,287.68 SQ. FT.
CUT	1,564,881.51 CU. YD.
FILL	1,564,208.93 CU. YD.
CUT / FILL NET	672.58 CU. YD.
MIN. CUT ELEVATION	-97.72 FEET
MAX. CUT ELEVATION	151.57 FEET

ELEVATIONS TABLE

Minimum Elevation (Depth of Cut / Fill in Ft.)	Maximum Elevation (Depth of Cut / Fill in Ft.)	Color
-100.00'	-90.00'	
-90.00'	-80.00'	
-80.00'	-70.00'	
-70.00'	-60.00'	
-60.00'	-50.00'	
-50.00'	-40.00'	
-40.00'	-30.00'	
-30.00'	-20.00'	
-20.00'	-10.00'	
-10.00'	0.00'	
0.00'	10.00'	
10.00'	20.00'	
20.00'	30.00'	
30.00'	40.00'	
40.00'	50.00'	
50.00'	60.00'	
60.00'	70.00'	
70.00'	80.00'	
80.00'	90.00'	
90.00'	100.00'	
100.00'	110.00'	
110.00'	120.00'	
120.00'	130.00'	
130.00'	140.00'	
140.00'	150.00'	
150.00'	160.00'	

NO.	REVISIONS	BY	DATE

DRAWN: TD / CKL	CHECKED:
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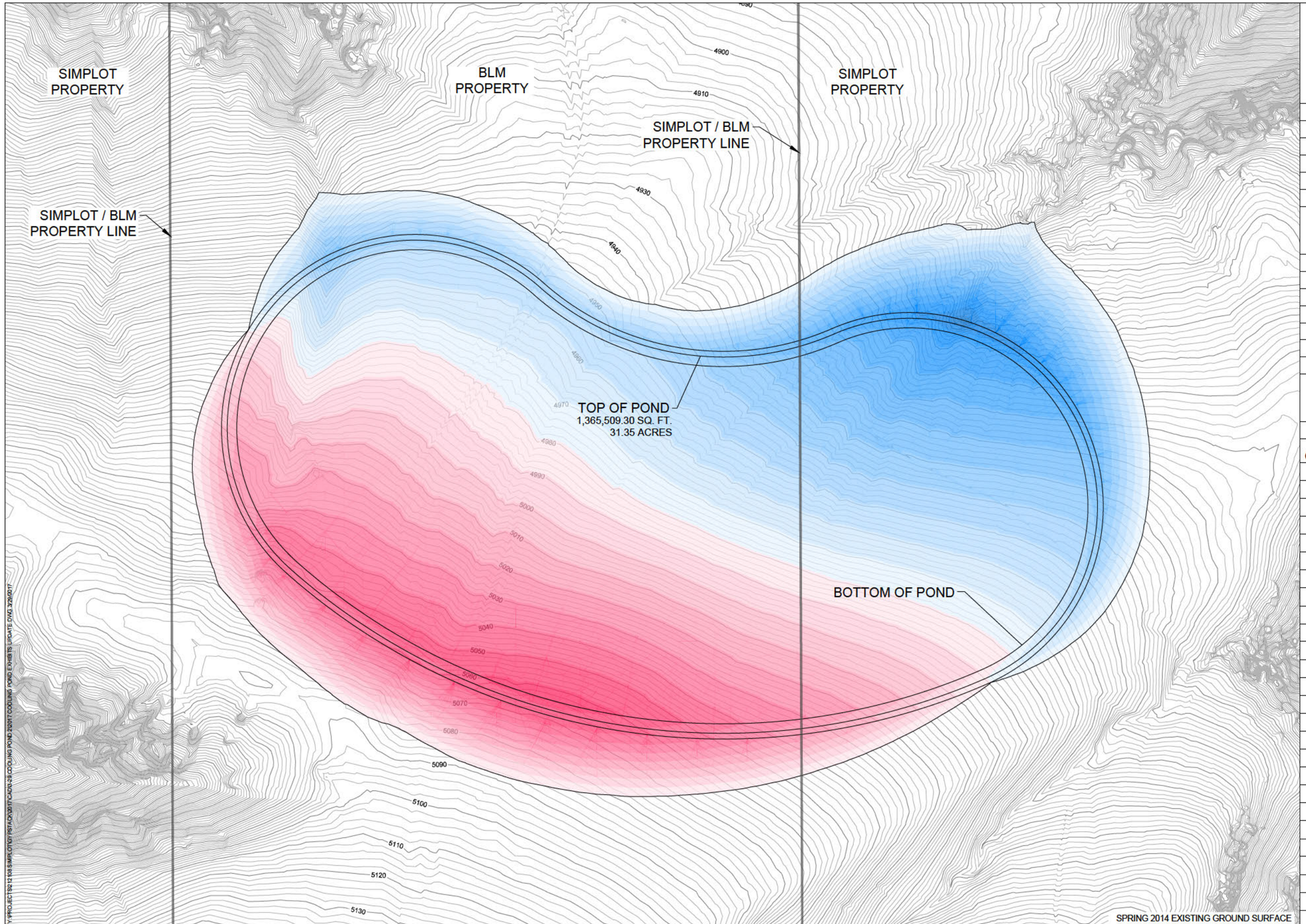
SIMPLOT COOLING PONDS

COOLING POND CUT - FILL PLAN

PROJECT NO. 212108-001

SHEET NO.



0 100' 200'

COOLING POND	
SIZE	31.35 ACRES
TOP ELEVATION	4989.20 FT
BOTTOM ELEVATION	4979.20 FT
OUTSIDE SLOPE	1.5:1 SLOPE
INSIDE SLOPE	2:1 SLOPE

CUT - FILL SUMMARY	
2D AREA	1,931,892.25 SQ. FT.
CUT	1,208,185.43 CU. YD.
FILL	1,212,711.48 CU. YD.
CUT / FILL NET	4,526.06 CU. YD. (FILL)
MIN. CUT ELEVATION	-84.60 FEET
MAX. CUT ELEVATION	114.21 FEET

ELEVATIONS TABLE

Minimum Elevation (Depth of Cut / Fill in Ft.)	Maximum Elevation (Depth of Cut / Fill in Ft.)	Color
-100.00'	-90.00'	
-90.00'	-80.00'	
-80.00'	-70.00'	
-70.00'	-60.00'	
-60.00'	-50.00'	
-50.00'	-40.00'	
-40.00'	-30.00'	
-30.00'	-20.00'	
-20.00'	-10.00'	
-10.00'	0.00'	
0.00'	10.00'	
10.00'	20.00'	
20.00'	30.00'	
30.00'	40.00'	
40.00'	50.00'	
50.00'	60.00'	
60.00'	70.00'	
70.00'	80.00'	
80.00'	90.00'	
90.00'	100.00'	
100.00'	110.00'	
110.00'	120.00'	
120.00'	130.00'	
130.00'	140.00'	
140.00'	150.00'	
150.00'	160.00'	

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SIMPLOT COOLING PONDS

COOLING POND 2 CUT - FILL PLAN

PROJECT NO. 212108-001

SHEET NO. 1

B

Gypsum Stack Design Concepts

Gypsum Stack Design Concepts

Don Plant, J.R. Simplot Company

Pocatello, ID

November 28, 2017

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Figures

Photos

1 Design Concepts

1.1 Typical Design

Through the various phases of lining and expansion projects undertaken at its Don Plant since 2008, J.R. Simplot Company (Simplot) has gained key design, construction, and operational experience for stack construction and lined gypsum stack operations (Simplot 2015), which can be applied to the proposed gypsum stack expansion into the south and east canyon areas. The following paragraphs summarize anticipated design and construction activities for this expansion.

Figure 1-1 presents a typical gypsum stack design cross-section for those portions of the lined gypsum stack vertical expansion that are constructed on top of the existing gypsum deposits (Ardaman and Associated 2017). The design includes a compacted gypsum perimeter containment dike and prepared gypsum subgrade (compacted, firm and smooth graded surface) that is covered with a textured 60-mil HDPE liner. A compacted gypsum starter dike and inner dike associated with operation of the gypsum slurry rim ditch distribution system are placed on top of the liner, as are three concentric stabilization underdrains that are provided beneath the perimeter slope of the future gypsum stack. Figure 1-2 also provides a typical design cross section for lateral expansions of the gypsum storage facility, beyond the exterior limits of the existing facility, where the HDPE bottom liner will be founded on natural ground surface. Depending on the particular site geometry, the height of perimeter earthen containment dike and initial starter dike for the gypsum stack may vary.

Photo 1-1 through **Photo 1-4** are construction photographs of the Don Plant phase 6 gypsum stack lateral expansion showing various stages of the earthen perimeter dike construction, site preparation, and lining of the exposed north wall slope of the existing gypsum storage facility.

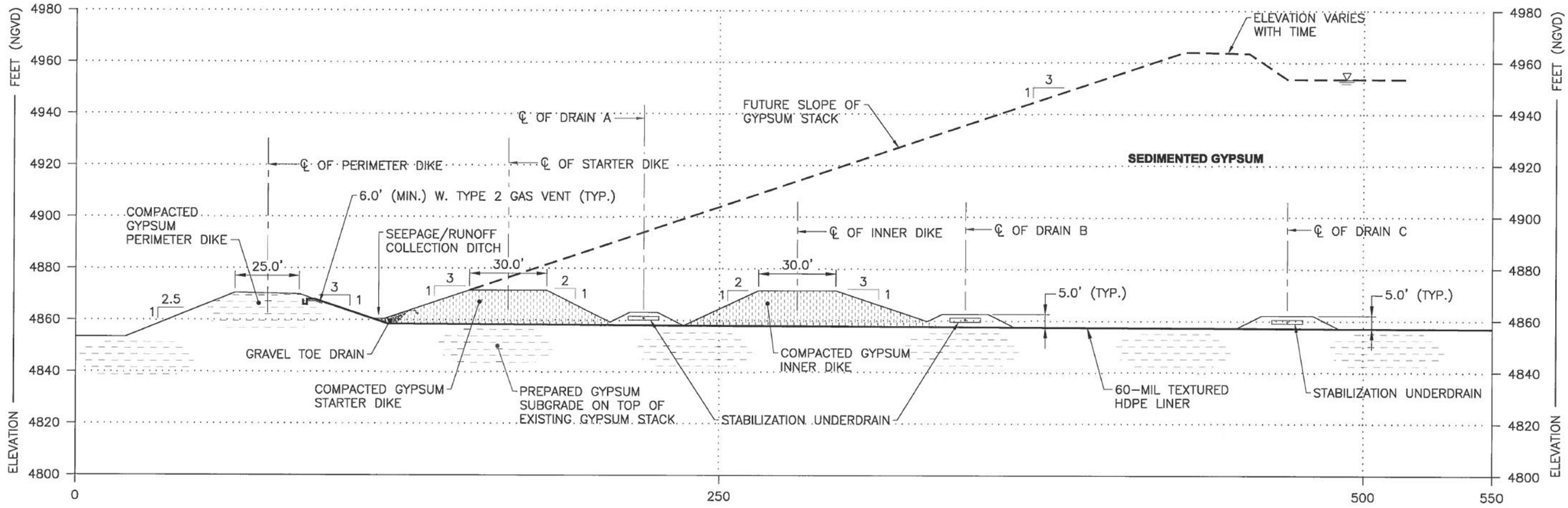


Figure 1-1.

TYPICAL CROSS SECTION OF PERIMETER DIKE AND STABILIZATION UNDERDRAINS FOR VERTICAL EXPANSION OF EXISTING STACK

SCALE: 1" = 40'

TYPICAL CROSS SECTION OF PERIMETER DIKE AND STABILIZATION UNDERDRAINS

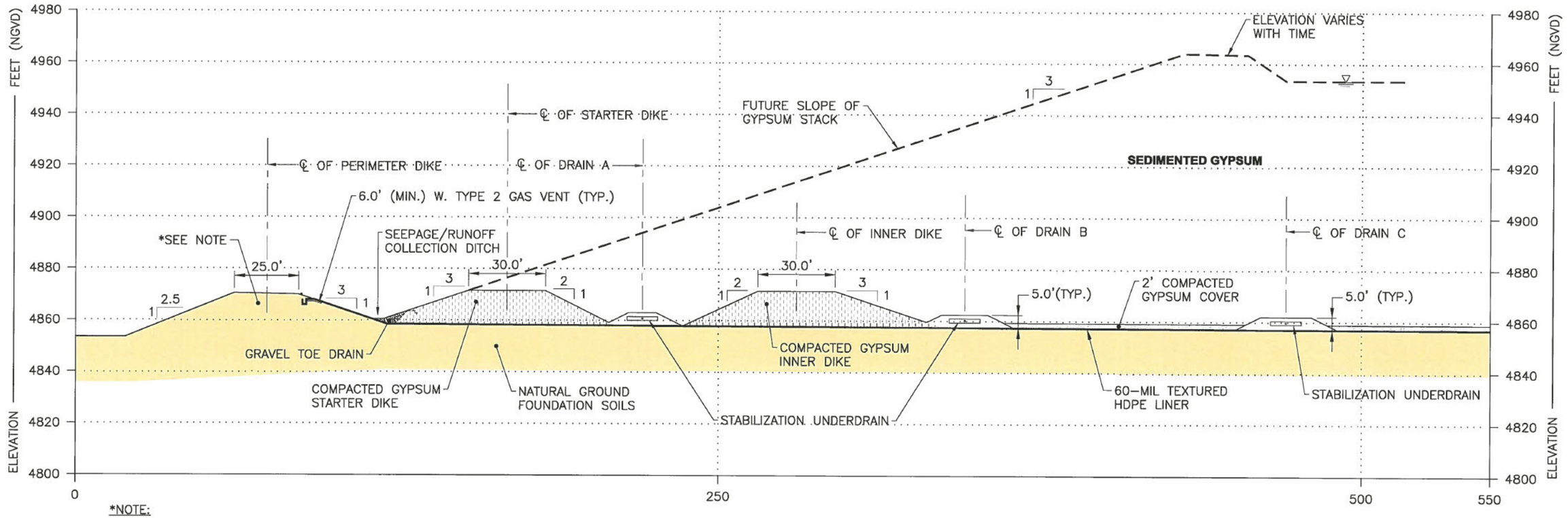
Ardaman & Associates, Inc.
Geotechnical, Environmental and Materials Consultants

PHOSPHOGYPSUM STORAGE AREA

Simplot

DRAWN BY: BTW	CHECKED BY: DAP	DATE: 06/14/17
FILE NO. 17-13-0049	APPROVED BY:	FIGURE: 2

S:\SIMPLOT\EIS\First Submittal to BLM\FIGURE 2 – TYPICAL CROSS SECTION OF PERIMETER DIKE ON GYPSUM.dwg 6/15/2017 10:17:32 AM, ruben.hoffman



*NOTE:

INITIAL DIKE HEIGHT WILL VARY BASED ON EXISTING NATURAL GROUND GEOMETRY.

Figure 1-2.
TYPICAL CROSS SECTION OF PERIMETER DIKE AND STABILIZATION UNDERDRAINS FOR NATURAL GROUND EXPANSION

SCALE: 1" = 40'

TYPICAL CROSS SECTION OF PERIMETER DIKE AND STABILIZATION UNDERDRAINS

Ardaman & Associates, Inc.
Geotechnical, Environmental and Materials Consultants

PHOSPHOGYPSUM STORAGE AREA

Simplot

DRAWN BY: BTW	CHECKED BY: DAP	DATE: 06/14/17
FILE NO. 17-13-0049	APPROVED BY:	FIGURE: 3

S:\SIMPLOT\EIS\First Submittal to BLM\FIGURE 3 -TYPICAL CROSS SECTION OF PERIMETER DIKE ON NATURAL GROUND.dwg 6/15/2017 10:18:07 AM, ruben.hoffman

Photo 1-1 - Recent Lateral Expansion Area Showing Perimeter Earthen Dike Construction and Site Preparation Prior to Lining

Photo 1-2 - Lined Lateral Expansion Looking at Graded Exterior Slope of Existing Gypsum Stack Prior to Lining

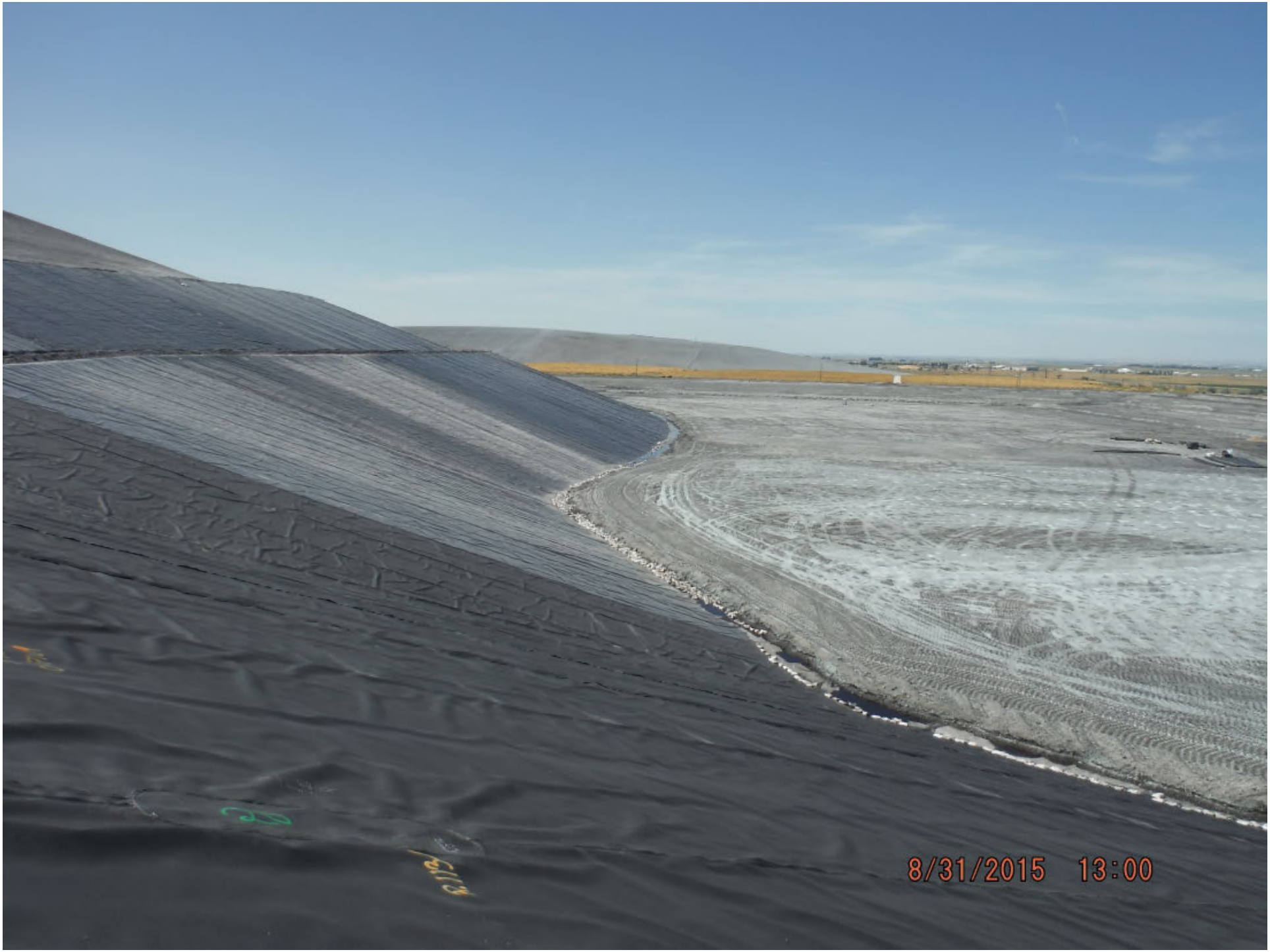


Photo 1-3 - Lined North Wall Slope of Existing Gypsum Stack Adjacent to Lined Expansion Area

Photo 1-4 - External Slope of Perimeter Earthen Dike Prior to Final Grading and Grassing

1.1.1 Bottom Liner Design

The proposed vertical and/or lateral expansions of the existing Don Plant gypsum stack system would be provided with a composite liner system that includes a 60-mil HDPE liner covered with either a compacted or sediment layer of gypsum that typically has a coefficient of permeability (hydraulic conductivity) equal to or less than 1×10^{-4} centimeters per second (cm/sec) over a vertical thickness of not less than 2 feet. The other options is a more conventional liner system consisting of an HDPE liner underlain by not less than 18 inches of clayey soil with a maximum hydraulic conductivity of 1×10^{-7} cm/sec.

The HDPE liner used beneath the gypsum stack exterior would be textured on both the top and bottom surfaces to provide additional friction at the interfaces with the overlying gypsum and underlying foundation soils (as needed to improve stability of the gypsum stack exterior walls). Smooth liner (top and bottom) would be provided within interior portions of the gypsum storage area where side slope stability is not a concern. At locations where the gypsum fill would abut relatively steep mountain slopes, the HDPE liner would be textured on the bottom and smooth on the top to minimize the effects of downdrag on the liner surface due to consolidation and settlement of the sedimented gypsum deposits placed on top of the lined surface.

1.1.2 Typical Preparation of Rugged/Steep Mountain Slopes

Photo 1-5 through **Photo 1-11** illustrate various stages of construction associated with grading and lining very steep and rugged mountain slopes (such as the south canyon area). **Photo 1-5** and **Photo 1-6** show some of the typical mountain slopes on the south side of the existing Don Plant gypsum storage area prior to and during blasting and regrading operations. **Photo 1-7** shows the prepared slopes on the south side of the existing gypsum stack prior to lining. After final grading of the rock slope, a thin layer (cushion) of dry gypsum or natural ground overburden soils (typically less than one foot in vertical thickness) is placed over the rock surface (**Photo 1-8**), followed by the placement of a high strength, woven geotextile that will separate the prepared rock surface from the overlying liner system (**Photo 1-9**). Although not shown, an additional 2-foot minimum thickness of dry gypsum is placed over the non-woven geotextile as a separation between the geotextile and the HDPE liner. **Photo 1-10** and **Photo 1-11** show examples of the HDPE liner placement on some of the mountain slope on the south side of the existing Don Plant gypsum stack. In areas that are flat enough for the prepared natural ground rocky slope to be thoroughly compacted with a smooth-drum roller with sufficient weight to break down and smooth all of the sharp edges on the regraded rock surface, a thick, 16-ounce, non-woven geotextile could potentially be used as a cushion layer between the prepared rock surface and the HDPE liner system.

Photo 1-5 - Typical Example of Rugged Mountain Slope Prior to Preparation

Photo 1-6 - Example of Mountain Slope During Blasting and Preparation for Lining

Photo 1-7 - Example of Prepared Mountain Slope Prior to Lining

Photo 1-8 - Regraded Mountain Slope Showing Placement of Dewatered Gypsum Cushion Layer

Photo 1-9 - Regraded Mountain Slope Showing Placement of High Strength Woven Geotextile

Photo 1-10 - Placement of HDPE Liner over Prepared Mountain Slope

Photo 1-11 - View of Liner Placement on Prepared Mountain Slope on the south Side of the Existing Gypsum Stack

2 References

Ardaman & Associates, Inc. 2017. *General Design and Construction Techniques for Gysum Stack Expansion*.

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